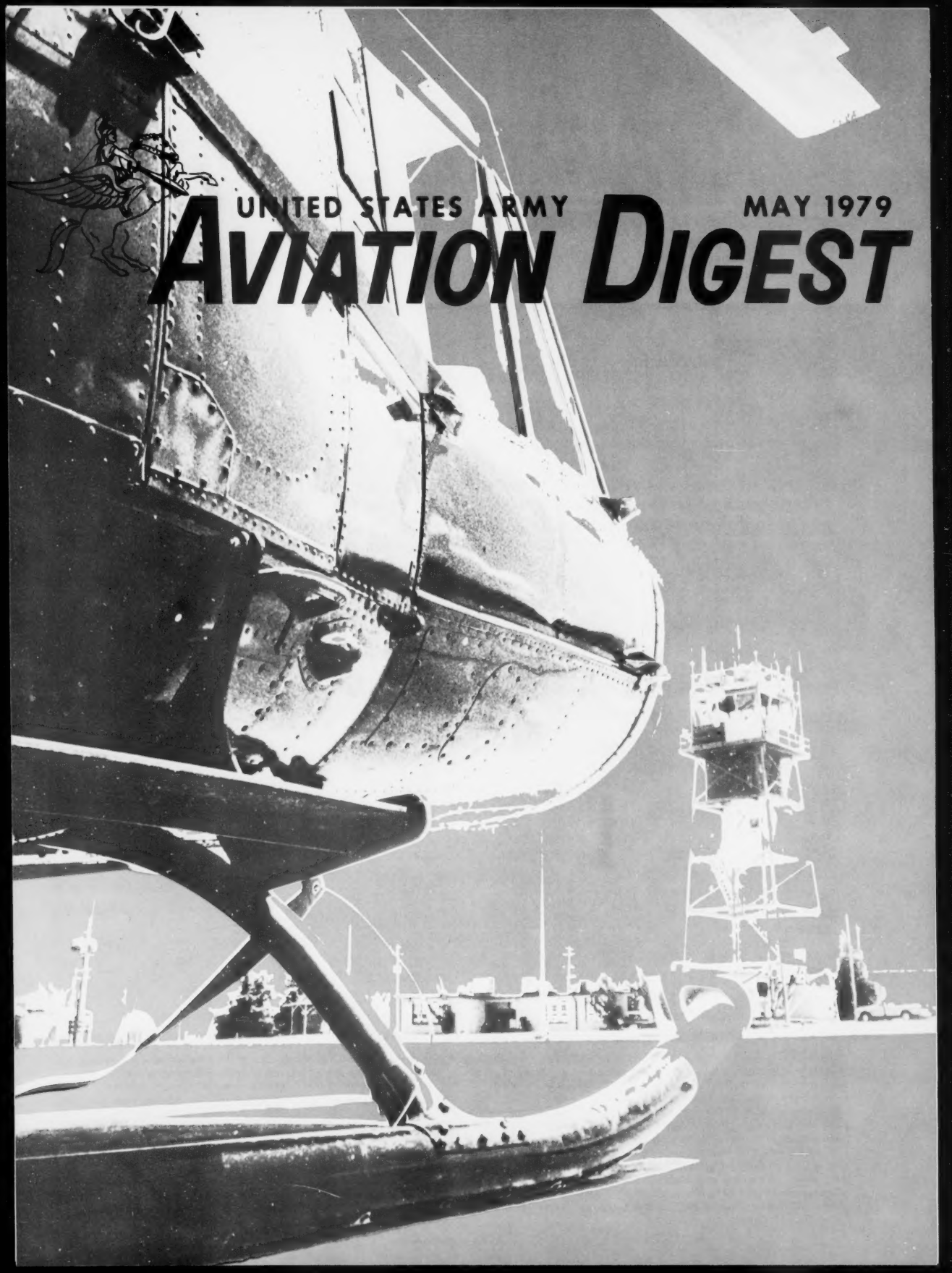
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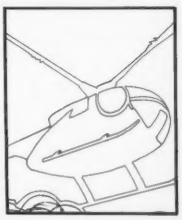
page 14

page 24

1 **Introduction** By MG Gerd S. Grombacher
2 **Army ATC School,** SFC James E. Petersen
7 **Airspace,** Jesse M. Burch Jr.
10 **125th Air Traffic Control Battalion (Corps),** SGT Steve Davis
12 **Reforger Firsts For The 59th,** PFC Patricia Dreher
14 **ATC Facilities: The New Look,** Albert Ayo Jr.
16 **Air Crash Search & Rescue Map Improvement,** Roderick G. Van Pelt
18 **ATC Reorganization,** Al Hinton
19 **AFOD In Germany**
20 **The Threat: Soviet Aerial Minelaying**
21 **Reporting Final**
24 **Readers Help Build An ASH,** MAJ Michael McClellan
27 **RAD Survey—Who, Me?,** CPT Henry Scheuer
32 **Vibration And The T63 Engine**
36 **"The Easiest Job In The Unit"**
38 **Summer Breezes**
39 **Nicad Batteries**
40 **PEARL's**
42 **DES Report To The Field: The CH-47 Aviator**
43 **Charlie Company Goes To England,** CPT Tony Geishauser
48 **ATC Action Line**
Inside Back Cover: **Controllers,** Jan Welch
Back Cover: **Readers Help Build An ASH**



page 32

page 40

page 43

ABOUT THE COVER

A UH-1 Huey parked at Libby Army Airfield, Ft. Huachuca, AZ, the home of the Army Communications Command. Articles featuring the USACC begin on page 1. Photograph by Ken Pieper

Richard K. Tierney
Editor

The mission of the ***U.S. Army Aviation Digest (USPS 415-350)*** is to provide information of an operational, functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research and development, aviation medicine and other related data.

The ***Digest*** is an official Department of the Army periodical published monthly under the supervision of the Commanding General, U.S Army Aviation Center. Views expressed herein are not necessarily those of the Department of the Army nor the U.S. Army Aviation Center. Photos are U.S. Army unless otherwise specified. Material may be reprinted provided credit is given to the ***Digest*** and to the author, unless otherwise indicated.

Articles, photos and items of interest on Army aviation are invited. Direct communication is authorized to: Editor, ***U.S. Army Aviation Digest,*** P.O. Drawer P, Fort Rucker, AL 36362.

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Communications Command

General Grombacher

IN THE 5 years since the U.S. Army Communications Command became the single manager for nontactical Army air traffic control, significant steps have been taken to improve the entire Army ATC system.

First and foremost we have approached ATC as a system with the intent of standardizing training, staffing, equipment and facilities as much as possible.

The command can point with pride to such improvements as the Army radar approach control facilities installed or being installed at Ft. Hood, TX; Ft. Sill, OK; and Ft. Campbell, KY; the 30 new terminal very high frequency omniranges to be installed this year and numerous new towers installed or being installed.

In this regard, the command is investing about $7.5 million per year in facilities improvements.

A very strong tool currently being developed is the Air Traffic Control Management Information System that will computerize such information as inventory and financial and personnel data. The computerization of this data will place full information about our ATC posture at our fingertips.

The assimilation of virtually all Army ATC into this command's mission by this October is an indication of how well we have done in the "nontactical" ATC field.

The "nontactical" is in quotes because this command's mission was never totally "fixed" ATC. We have always had some involvement in tactical ATC. Now that involvement is patent.

We will, of course, approach this "new" field with the same professionalism and systematic approach we have used for the last 5 years.

Army controllers are, of course, not solely involved with Army air traffic. Virtually every facility in the ACC family deals with civil aircraft, either regularly or occasionally.

Army ATC facilities are among the busiest in the world in terms of number of movements handled. The safety record of Army controllers is outstanding—and it will stay that way.

The headquarters activity staff is composed of dedicated ATC professionals. Many of them also are aviators so they are well aware of the requirement to provide and the necessity of providing the highest quality people and equipment to ensure the safety of all aviators who use our facilities.

Major General Gerd S. Grombacher
Commander
USACC

Acronym Key
Page 9

Army ATC School

Photographs by SP4 Arnold Restivo

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THE ARMY'S AIR Traffic Control School, U.S. Army Aviation Center, Ft. Rucker, AL will complete 10 years of service to the Army aviation system this year. Thousands of enlisted Soldiers, officers and warrant officers have been graduated from the school's various courses of instruction during this period. Continuous updating and modernization of instructional techniques and equipment, has contributed greatly to the overall potential of graduates as they enter the "real

Acronym Key
Page 9

ATC instructor (L) with students during common subjects phase of training

world" of Army aviation.

Army ATC requires wide varieties of skills. Those skills are not only required of controllers, but also must be a basic portion of the repertoire of flight operations personnel and aviation safety team members. These same skills are essential to aviation unit commanders, officers and warrant offices involved with airfield operations and the management of airspace and aviation facilities. To this end, the Army Air Traffic Control School at the Aviation Center is dedicated.

First and foremost, the mission of the school is to turn out well-informed and dedicated controllers who hold the basic knowledge, skills and potential for entering the worldwide network of air traffic control with a minimum of transition time. This is done by systematically working the student controller through the school's branches and phases of training according to his or her particular MOS requirements.

In the case of the control tower operator (MOS 93H), students are introduced to aviation and general Army air traffic control at the Common Subjects Branch. Under self-paced instruction, students gain a working knowledge of basic aviation regulations, concepts and theories common to all air traffic controllers worldwide.

After about 10 days of study, students are administered the FAA CTO test by the school's designated FAA testing representative. Successful completion of this test, and an FAA Class II flight physical are the student controllers' learner permits to train at Army ATC facilities. They are then recognized worldwide by the FAA and the ICAO as capable of working into the overall system.

Upon successfully completing the CTO examination, students move into the next phase of training, which consists of about 5 days, studying weather, radio/telephone procedures, FLIPS, aircraft recognition, NOTAMs, and general operating procedures. An additional day of intensive study of the local area aviation map, approach plates, SID routes and all pertinent information needed for controlling traffic at the Aviation Center is required.

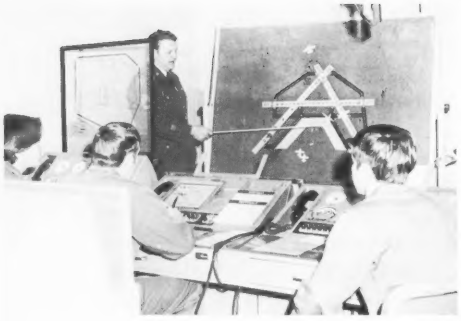
The next training phase is non-radar approach control (manual lab) where students learn to control air traffic, using basic time, distance and altitude separation criteria. Under the watchful tutelage of experienced air traffic control instructors, students learn to safely expedite traffic into and out of Cairns Army Airfield using classroom laboratory approach control simulators. Students then study the duties and procedures involved in a flight operations center/flight coordination center.

The radar air traffic controller (MOS 93J) follows the same track as does the 93H, until reaching the manual lab. In the manual lab, the 93Js receive an additional 4 days training in emergency procedures pertinent to radar environment.

Both 93H and 93J students spend an average of 33 training days in the self-paced course of instruction at the Common Subjects Branch before moving on to the next phase of training at Kelly Hall. The Advanced Branch pulls most of the loose ends together with knowledge gained into a workable and more meaningful study of the air traffic control facility and its operation.

Tower operators spend some 100 to 120 hours in self-paced, individual

Student in academic phase of Advanced Branch, Kelly Hall



Trainees receive basic VFR control tower procedures at Advanced Branch, Kelly Hall

instruction in the classroom and in the tower simulators. Beginning with the three position VFR tower, students move through the flight data position, the ground control position and the local control position. During this time, coordination of all techniques, regulations and procedures are combined both academically and in the working position tower simulators under as close to authentic conditions as can be projected. Progressive check-offs (by position) are accomplished and testing is conducted with students working all three positions prior to phase completion.

After gaining the necessary expertise in the three position tower, 93H students move into the four position configuration, where the manual approach controller is the heart of the operation. This phase incorporates and expands on the integration of the IFR manual approach control function as related to the three position VFR procedure. Team concepts are stressed which enhances each student's ability to adapt to the requirements of facilities throughout the Army's air traffic control network. Over-the-shoulder testing is a requirement for completion of this phase of instruction.

A tactical ATC orientation is provided for the student controllers (both 93H and 93J) to better assist them in the transition from the Advanced Branch to the Deployment Branch of the school. A briefing on tactical rules and regulations and a general simulated operation of Wolfpit LZ procedures and layout, is conducted by the Deployment Branch. Wolfpit operations will be dealt with at greater length in the section pertaining to Deployment Branch.

The data room at Kelly Hall is the heart of the instruction given 93J students at the Advanced Branch. It houses the Sigma V computer

Novice controller learns arrival control procedures on radar simulator at Advanced Branch

that generates up to 40 radar target aircraft, including each target's airspeed, altitude, heading and geographic position within the 262,144 square mile "gaming area" depicted on the radar screens of the 10 simulated radar facilities. Maintenance updates and changes to the programs of instruction are accomplished "on site" to keep the training as comprehensive, meaningful and realistic as possible. This is the most modern concept in teaching radar air traffic control in the world, and is capable of duplicating any situation which could occur in the field.

Radar students move through a series of phases in which they are given academic instruction followed by "hands on" laboratory experience. They progress from basic equipment alignment procedures through flight data coordination exercises, arrival control, final control using precision approach radar, surveillance approach radar and instrument landing system procedures. Student 93J controllers also receive training in radar-out procedures, which closely follow those principles involved in manual approach control. Emergencies are dealt with as well as aircraft requiring special handling, such as those with inoperative communications and navigational equipment and gyros. Phase testing and progress checking, over-

93H students learn manual approach control procedures under the careful tutelage of experienced air traffic control instructors

the-shoulder, ensures that students meet the criteria for completion of each phase.

Following tactical ATC indoctrination, using Wolfpit LZ in a simulated environment, 93H and 93J students move on to Deployment Branch after having spent about 3 to 6 weeks, respectively, with the Advanced Branch at Kelly Hall.

At Deployment Branch, student controllers spend about 3 weeks transitioning from classroom and simulated operations to live traffic and the operation of organizational equipment.

Both 93H and 93J students spend their first week learning Communications and Electronic Operating Instructions, electronic warfare, tactical field equipment and practical application. These instructional phases differ only in that the 93H students and the 93J students are familiarized with the equipment peculiar to the requirements of their particular MOS.

The second week is conducted at any one of several stagefields, or a field GCA site, operated in conjunction with the flight training mission of the Aviation Center. Under close supervision of facility-rated instructors, 93H students control live traffic in a real tower under actual field conditions. At a field GCA site, 93J students use radar to control live traffic, also under close supervision.

Week number 3 with Deployment Branch is the phase where the students receive their orientation with tactical ATC. At Wolfpit LZ, a forward area refueling and rearming point, student controllers and student pilots work together to achieve the coordination necessary to accomplish the mission. Tower, GCA and flight coordination center operations are conducted in a tactical environment.

Tactical ATC teams are formed and moved forward to smaller landing zones where they provide advisory services for fledgling aviators. A portion of this training is conducted in a chemical, biological and radiological environment and all tasks performed during these operations are in accordance with the Soldier's Manual. Students are flown to and from these sites in operations

Trainees learn flight following procedures at LZ Wolfpit

designed to familiarize them with actual conditions encountered in an authentic tactical environment.

Deployment Branch is the final phase of training prior to graduation when the newly trained controllers move from the school to the field, where they will be given that additional training and experience necessary for them to fill the gaps and function as members of the U.S. Army ATC team.

While the instruction of Army air traffic controllers is the primary mission of the ATC School, it is not, by any means, the only mission. The ATC Officer/Warrant Officer Course, the Air Traffic Control and Flight Operations Coordinator ANCOES Course, the Commander's Readiness Course, the Aviation Safety Officer Course, the Advanced Warrant Officer Course, the Flight Surgeons Indoctrination and the advanced individual training of flight operations coordinator (MOS 71P) require heavy involvement in all phases of instruction at the school. National Guard and Reserve Component ATC programs of instruction also are a part of the school's mission, both "in-house" and "on sites."

The ATC Officer/Warrant Officer Course, conducted at the Ad-

Student learns final control procedures on radar simulator at Advanced Branch

Acronym Key
Page 9

Flight operations coordinator student using tactical map at LZ Wolfpit

vanced Branch, teaches ATC management; facility management; establishing navigational aids; TERPS; the facility rating program; airspace management; tactical ATC doctrine; and tactical equipment employment. The FAA CTO preparational instruction and testing program also is administered.

ANCOES 93J and 93H students learn facility management, TERPS, the facility rating program, facility flight checking, and tactical ATC doctrine and equipment during their stay at the Advanced Branch. ANCOES 71P students expand on their knowledge of operations procedures and on management techniques applicable to their field.

The Commander's Readiness Course teaches tactical ATC doctrine, tactical ATC equipment employment and airspace management in the combat zone. The Aviation Safety Officer's Course covers aviation safety as it relates to ATC, ATC facilities and navigational aids. The Advanced Warrant Officer Course students are briefed on tactical ATC doctrine, tactical ATC equipment, and tactical TERPS as it will apply in the combat zone. The Flight Surgeon's Indoctrination stresses the role of the air traffic controller and relates that role to that of the aviator with regard to the physical stresses, requirements and peculiarities of the job.

The EURO/NATO Voice Communications Procedures Course is presented to student aviators from several allied countries by the Advanced Branch. This course qualifies students in voice procedures and techniques essential to ICAO procedures. Students from Germany, Sweden, Denmark, Saudi Arabia and Honduras have received training in radio/telelphone, ATC abbreviations and ATC procedures thus far.

Training of flight operations coordinators (MOS 71P) is conducted under the supervision of the Deployment Branch. Students learn both fixed base operations and tactical application of their complex mission, including regulations governing Army aviation, scheduling, record keeping, mission allocation and priority, communications and coordination procedures, ATC orientation and aviation safety.

Not the least of the ATC school's obligation is to provide a program of instruction and assistance to Army National Guard and Reserve Components. Facility rating and CTO certification assistance is provided at Ft. Rucker during the component's annual 2 weeks active duty for training and to individuals on extended active duty as regular students at the school. Assistance and instruction also is provided by instructors from the school who travel to units on request for a series of 2-day weekend drill periods, on a once per month basis. Continuity of instruction and professionalism is assured and the program has been widely applauded by those served by the school's personnel.

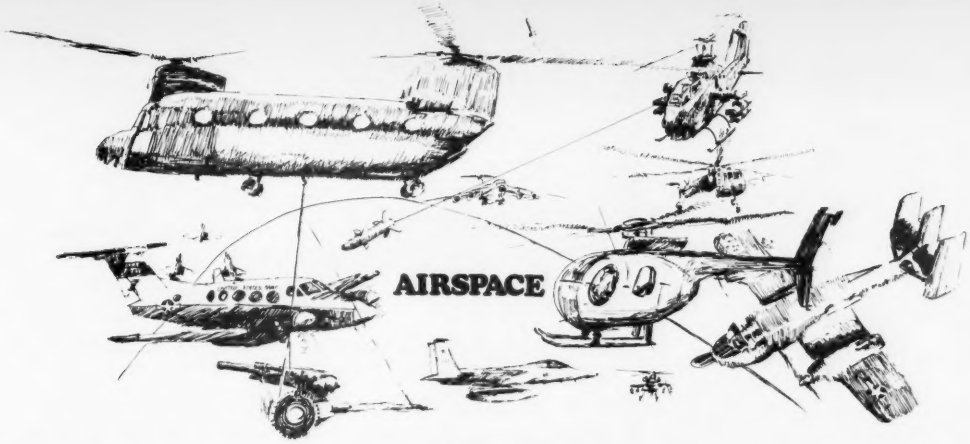
Constant updating, innovation and attention to the requirements of the field requires new developments at the ATC school to keep abreast of and ahead of our obligation as the demand for readiness

Tactical control tower at LZ Wolfpit is familiar sight to student controllers

increases. Such ideas as electronic transportation of computer data and target information from the base at Kelly Hall, on a worldwide scale, so that radar controllers can be more rapidly and economically facility rated (using their own unit equipment) are being studied and implemented. Video mapping equipment is being installed. Testing of new hardware and tactical equipment is constantly a part of the school's day to day operation. Striving for increased realism under simulated conditions is manifested in studies currently underway to marry up programs between the ATC school and flight simulators via computer tie-ins, which will create realistic pilot/controller situations and coordination procedures. Holographic images in tower labs to project aircraft in traffic patterns is technologically possible and is being studied for integration into the system.

Suggestions, ideas, comments, criticisms and continued input from the field are not only welcomed, but solicited. Only in this way can the school continue to improve and adapt to the ever-changing demands of Army aviation. Placing the most highly qualified graduate in the field is the school's mission and constant improvement and modernization is fundamental to the accomplishment of that mission.

Acronym Key
Page 9



AIRSPACE

Jesse M. Burch Jr.
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AIRSPACE OVER the United States, its possessions and territories has in the past few years become a critical national resource. Ever increasing numbers of users are placing greater and greater demands on the system, thus requiring the imposition of more and more stringent control. Management of these resources requires constant coordination and continual cooperation of all users.

Army commanders may, at their discretion, use the airspace over their installations in any manner they desire, right? *Wrong!!* Although some commanders may believe this to be true, they may use that airspace only in accordance with Federal Aviation Regulations or with specific approval of the Federal Aviation Administration.

More than two decades ago the 85th Congress enacted Public Law 85-726, known as the Federal Aviation Act of 1958, thus creating the Federal Aviation Agency. This newly created agency was charged with the overall responsibility for management of navigable airspace within the National Airspace System. The name of the agency later was changed to the Federal Aviation Administration, and it lost its status as an independent agency with the creation of the Department of Transportation, but it retained its responsibility for overall management of the NAS.

For better understanding of the FAA authority and responsibility, the following excerpts from the FAA Act are extracted and reprinted below:

NATIONAL DEFENSE AND CIVIL NEEDS

SEC. 306. (72 Stat. 749,49 U.S.C. 1347) In exercising the authority granted in, and discharging the duties by, this Act, the administrator shall give full consideration to the requirements of national defense, and of commercial and general aviation, and to the public right of freedom of transit through the navigable airspace.

AIRSPACE CONTROL AND FACILITIES

Use of Airspace

SEC. 307. (72 Stat. 749,49 U.S.C. 1348) (a) The Administrator is authorized and directed to develop plans for and formulate policy with respect to the use of the navigable airspace; and assign by rule, regulation, or order the use of the navigable airspace under such terms, conditions, and limitations as he may deem necessary in order to insure the safety of aircraft and the efficient utilization of such airspace. He may modify or revoke such assignment when required in the public interest.

The paragraph below contains definitions of some of the terms used in this article.

National Airspace System. The common network of U.S. airspace; air navigation facilities, equipment and services; rules, regulations and procedures, technical information, and manpower and materiel. Included are system components shared jointly with the military.

Navigable Airspace. Airspace at and above the minimum flight altitudes prescribed in the FARs, including airspace needed for safe takeoff and landing.

Many individuals interpret Section 306 of the FAA Act as giving the Department of Defense priority over other users of the NAS. This is true only when our national security is threatened or when it is clearly justified in order to establish and maintain a state of defense readiness as directed by the President and Congress. Such priority must still be approved by or coordinated with the FAA.

To ensure Army airspace requirements receive appropriate consideration, constant coordination with FAA at all levels is required.

At the national level, for the most part, interface with the FAA is accomplished by the U.S. Army Communications Command's Aeronautical Services Office. The Department of The Army Deputy Chief of Staff for Operations and Plans has the overall responsibility for Army airspace management, but the Director,

Acronym Key
Page 9

USAATCA-ASO, per AR 95-50, serves as executor for this responsibility. The normal chain of command to USAATCA-ASO is through the U.S. Army Communications Command through the U.S. Army Air Traffic Control Activity. In this instance, however, direct contact between DCSOPS and USAATCA-ASO is authorized by regulation.

Regional level interface is accomplished through the Department of the Army Regional Representatives. The DARRs are assigned to and serve as an extension of USAATCA-ASO. They are responsible for coordinating with FAA all Army airspace proposals within their geographical area of responsibility. There are eleven FAA regions and eight DARR offices. Three of the DARR offices are responsible for two regions. AR 95-50 provides the specific location of each DARR office and its geographical area of responsibility.

At the local or installation level, interface with FAA is accomplished by the air traffic and airspace officer. AR 95-50 requires the designation of an installation AT&A officer and further requires that this individual be the most qualified available to deal with Army airspace and air traffic control problems.

Most problems are resolved by agreements reached at the local level.

The AT&A officer is authorized and encouraged to request assistance from the DARR on any airspace or air traffic problem. Assistance also may be obtained from USAATCA-ASO, especially on controversial matters. It is through a team effort at all three levels that Army airspace requirements are satisfied.

Army Airspace Requirements. What are Army airspace requirements? Why is special consideration required? The FARs require that special use airspace be established to contain activities which constitute a hazard to nonparticipating aircraft. In performing its role—to move, shoot and communicate—the Army frequently conducts activities that are hazardous to nonparticipating aircraft.

For example, artillery firing, rocket launching and drone operations are just a few of the activities that may be classed as hazardous and normally are conducted in restricted areas specifically designated by FAA for that purpose.

Other types of activities may be contained in other categories of special use airspace. For example, at the Aviation Center at Ft. Rucker, AL, an alert area has been designated to notify other airspace users of the high density of training aircraft. A prohibited area has been established at Rocky Mountain Arsenal denying the area to all unauthorized aircraft. There are controlled firing areas designated in practically every state in the Union.

There is another category of special use airspace frequently required by the Army to contain aircraft of a sister service operating in support of the Army mission. This is the military operations area. An MOA is designed to provide maneuvering space for aircraft operating at less than 10,000 feet MSL and at speeds in excess of 250 knots. An MOA does not impose any restrictions on VFR aircraft; however, FAA will not clear IFR aircraft into an MOA unless standard IFR separation can be provided to all nonparticipating IFR aircraft from all participating aircraft, either IFR or VFR, and from other nonparticipating IFR aircraft.

Commanders exercising control over special use airspace areas are designated as using agencies and are required to monitor and report on use of such areas. They must review each area at least once annually and submit proposals to modify or eliminate the area as requirements change.

Army using agencies are required to release their restricted areas back to FAA when such release will not compromise national security or interfere with using agency operations. These areas become joint use restricted areas and FAA will designate one of its facilities as the controller agency. Remember, the using agency has priority use of the area when it is being used for the purpose for which it was designated and the controlling agency authorizes and directs air traffic through the area when released by the using agency.

Another term associated with restricted area is shared use. A shared use restricted area is one in which the using agency permits other users to conduct operations. Of necessity such operations must be compatible or not interfere with the operations of the using agency. As a matter of interest, a shared use restricted area also may be designated as joint use.

Letters of agreement on procedure are required to be developed for both joint use areas. The letter for joint use should detail how the area will be activated and released. It will include the normal operation schedule. The letter for shared use will specify the type of operation, any limitations imposed, normal operation schedules, and reporting procedures. Both letters may be amplified to contain all useful information.

Federal Aviation Regulations require that each using agency submit an annual utilization report for each restricted area. These reports must include information on all activity conducted in the area, including that of shared users. The specific time period covered by the report each year is from 1 October through 30 September. Failure to describe carefully and accurately the use of

a restricted area and to justify fully its retention may result in review action by FAA for possible recision or modification of the area.

A major problem in satisfying Army airspace requirements is in understanding how much time is involved getting special use airspace designated. FAA requires a minimum of 6 months from the time it receives a proposal to establish a restricted area until final action is taken. An alert area, controlled firing area or MOA will take about 3 months.

These time periods are required to ensure that public interest is protected. It allows FAA to publish a notification of the proposal, to hold public hearings if necessary, and to publish the final action.

Should a proposal become controversial, such as receiving considerable public or political opposition, then the time period required may be extended greatly, perhaps years. It behooves commanders to be aware of these time requirements and take them into account in their initial planning.

Commanders should be aware of assistance available to them with regard to satisfying their airspace requirements. Direct communication with the DARR or USAATCA-ASO is authorized and encouraged. Proper planning and proposal development may save months in obtaining final FAA approval.

Commanders also should use their AT&A officer to the maximum extent possible. To increase the knowledge and effectiveness of the AT&A officer, USAATCA-ASO is conducting a series of seminars to be held in various FAA regions. Seminars are planned for the FAA Southern Region next month; the Western/Northwest/Alaska and Hawaii Regions in September; and the Eastern/New England Region in November. Other regions already have held their seminars, but will be rescheduled for late 1980.

The Army policy is stated in AR 95-50. Basically, it states that Army airspace requirements must be minimized to the extent possible and commanders must carefully scrutinize each additional proposal to ensure that the proposed activity cannot be conducted in existing special use airspace areas. It is Army policy to cooperate with other users of the NAS to the extent possible, yet retain the capability to perform its prescribed mission.

Acronym Key

AAF	Army airfield
ACC	(U.S.) Army Communications Command
ACS&R	air crash search and rescue
ADIZ	Air Defense Identification Zone
AFOD	Army Flight Operations Detachment
AHP	Army heliport
ANCOES	Advanced NCO Education System
AR	Army regulation
ARAC	Army radar approach control
ARTS-II	Automated Radar Terminal System — II
ASO	Aeronautical Services Office
AT&A	air traffic and airspace
ATC	air traffic control
CBR	chemical, biological and radiological
C-E	Communications — Electronics
CEOI	Communications and Electronics Operating Instructions
CONUS	continental United States
CTO	control tower operator
DAIG	Department of the Army Inspector General
DAMI	Office of the Assistant Chief of Staff for Intelligence
DARR	Department of the Army Regional Representatives
DCSOPS	Deputy Chief of Staff for Operations and Plans
DMA	Defense Mapping Agency
DMAHTC	DMA Hydrographic Topographic Center
DMZ	demilitarized zone
DOD	Department of Defense
EURO	European
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FCC	flight coordination center
FLIPS	flight information publications
FOC	flight operations center
FY	fiscal year
GCA	ground controlled approach
ICAO	International Civil Aeronautics Organization
IFR	instrument flight rules
IG	inspector general
ILS	instrument landing system
JTMLS	joint tactical microwave landing system
LZ	landing zone
MLS	microwave landing system
MOA	military operations area
MOS	military occupational specialty
MSL	mean sea level
NAS	National Airspace System
NATO	North Atlantic Treaty Organization
NAVAIDs	navigational aids
NCO	noncommissioned officer
NDB	nondirectional beacon
NOTAMs	notices to airmen
PAR	precision approach radar
PIP	product improvement program
PIREPs	pilot weather report
PPR	prior permission required
RAPCON	radar approach control
ROK	Republic of Korea
SAR	surveillance approach radar
SID	standard instrument departure
SOTAS	Stand-Off Target Acquisition System
STEP	Service Test and Evaluation Program
TERPS	Terminal Instrument Approach Procedure
TVOR	terminal very high frequency omniranges
USAATCA	U.S. Army Air Traffic Control Activity
USACC	U.S. Army Communications Command
USAREUR	U.S. Army Europe
VFR	visual flight rules
VLATME	very lightweight air traffic management equipment

125th Air Traffic Control Battalion (Corps)

"Guardian of the Skies in Korea"

Sergeant Steve Davis
1st Signal Brigade (USACC)
U.S. Army Communications Command
Fort Huachuca, AZ

IF YOU'VE FLOWN the "fence," shot pinnacle approaches on isolated mountaintops, made GCA approaches at A-511, or flown anywhere in the Republic of Korea, you've probably worked with the Soldiers of the 284th Aviation Unit or the United States Army Air Traffic Control Battalion Korea (Provisional). They are known as the *Guardians,* and have established their headquarters in Yongsan, with sites located throughout Korea. On your next assignment to Korea, you'll find that although the name has been changed, the mission and operation procedures are still the same.

On 1 October 1978, the U.S. Army Air Traffic Control Battalion Korea (Provisional), was redesignated as the 125th Air Traffic Control Battalion (Corps) with two line companies, the 191st ATC Company (Fwd), and the 244th ATC Company (Fwd) and a headquarters and headquarters detachment. The battalion operates nine control towers, two FOCs and four FCCs throughout Korea. The 125th has a complex mission, but, as stated it does exactly what its name implies: controls air traffic.

To accomplish its mission, the 125th has two flight operations centers which direct both U.S. and ROK aircraft. FOC North, manned by the 191st ATC Company, controls air traffic north of Seoul. FOC South, consists of the Soldiers of the 244th ATC Company and controls air traffic in the southern portion of the country.

Visual Flight Rules. Both FOC North and South follow aircraft flying VFR and using a flight plan filed by the pilot before departure. The flight following procedures require that the place and time of departure and route of flight be scheduled accurately as well as the notation of stopover points, ground time at stopovers, and time and place of destination.

Inflight, the pilot navigates according to fixed ground positions and reports to FCCs or FOCs the aircraft's position, and other pertinent information such as changes of flight plan or inflight problems. The operation is basically a radio communications and visual method of navigation and flight following as contrasted by IFR, which uses sophisticated electronics equipment at permanent locations.

Aircraft Control. The major FCCs also monitor aircraft. They receive and relay filed flight plan information from airfield or heliport operations to their controlling FOCs. They also receive and relay position reports and flight plan changes from airborne craft to the flight operation centers and advise the FOC when aircraft pass to and from their control sector. When the FOC receives the report from the subordinate FCC, it enters the information on a flight position board and disseminates pertinent information to air defense, destination airfields, or other FCCs along the aircraft's flight plan. The result is a concert of communications which ensures that aircraft locations are known at all times.

FOC North and the Buffer Zone. While air traffic control procedures are well established and follow general rules, the situations which aircraft and air traffic controllers experience are infinite and acutely dependent upon the territory. Korea especially is a challenge to the abilities of even an experienced air traffic controller. To say the least, flying north of Seoul is sometimes a hair-raiser since the Korean Tactical Zone lies in the area of FOC North, to include the 150-mile buffer zone traversing the peninsula. Great care and accuracy must be exercised both by the pilot and controller. Flight following in this area must be precise since numerous hazards exist for aviators, the foremost being the possibility of inadvertent overflight into North Korea.

Pilots must use ground checkpoints to accurately pinpoint their location. They keep FOC North advised of their position at all times while in the buffer zone area.

Of what importance is this to FOC North? The air traffic controllers at FOC North must ensure that an aircraft is where it is supposed to be at the times

Acronym Key
Page 9

indicated on the pilot's flight plan. If a pilot is off schedule or fails to make a position report while flying in the buffer zone, FOC North requests this information from the aircraft.

Helping FOC North monitor the buffer zone and DMZ are two FCC sites—FCC Evenreach and FCC Warrior. Located on isolated mountaintops, often inaccessible by ground vehicles, these two FCCs provide 24-hour "watch dog" service of the area, ensuring that friendly aircraft do not stray into the DMZ, and additionally ensuring that enemy aircraft do not enter into South Korean air. Should this occur, the FCC would immediately advise South Korean Air Defense positions nearby. FCC Warrior is the only radar FCC in the Army, and was awarded the distinct honor of Air Traffic Control Facility of the Year in 1976.

When the pilot radios the aircraft position to the nearest FCC, that FCC coordinates with the flight operation center by advising the FOC of the aircraft's position. The position is logged on the FOC North control board. The flight control board provides a ready display of all aircraft in the FOC North control area, which is often quite a number. There are sometimes as many as 200 aircraft in the area at one time, which are provided "round-the-clock" service by FOC North.

In addition to actual air traffic communications with aircraft for control purposes, FOC North receives PIREPs from aircraft in flight, which are pilot reported weather conditions. The PIREPs are relayed by FOC North to the Yongsan Air Force weather station. FOC North also provides an advisory service to inflight aircraft, offering information on weather conditions and conditions that may affect an aircraft.

When a southbound aircraft is approaching Seoul, FOC North "hands-off" the aircraft to FOC South, which assumes direct air traffic control of the aircraft as it passes into its sector.

FOC South. When FOC South assumes responsibility for an aircraft from FOC North, it places the aircraft on its flight position board and flight-follows it to its destination. FOC South also may call any one or more of the southern FCCs or operations centers at airfields to advise them of the en route control facilities.

While FOC South has a substantially lower traffic count than its northern counterpart, the facility nonetheless stays busy. Staffed with U.S. military controllers, the center also employs Korean National controllers who form a liaison between U.S. and Korean air traffic control centers.

Flying around Seoul is not quite as treacherous as flying in the buffer zone, but flight hazards exist. There is a "no flight" zone surrounding Seoul. During 1974 a commercial cargo plane inadvertently entered the restricted zone and this caused some repercussions. Mistakes can happen even though the area is defined by daytime aerial markers and ground-based strobe lights that flash nighttime warnings to aircraft. "These markers are for the benefit of the pilots," states the facility chief of FOC South, "and do not really assist us in our job. The entire responsibility of avoiding the restricted area lies with the pilot." If an aircraft accidently approaches the restricted area or actually violates the "no flight" zone, Korean Air Defense will warn the aircraft by using a "Guard" radio frequency.

All things considered, flying in the Republic of Korea can be a challenge to aviators. To fly safely, they depend upon the professional abilities of experienced air traffic controllers. The 125th Air Traffic Control Battalion is proud of its past records. In 1977 and 1978 more than one and a half million movements were controlled by the Soldiers of the battalion. The 125th Air Traffic Control Battalion will continue its mission in Korea, serving as the "Guardians" of the skies and maintain its motto: "Service is our product."

[For a pilot's view on flying in the Korean buffer zone see, "A Helicopter Flight In The Korean Buffer Zone," by CPT Erick L. Mitchell, in the March 1979 *Aviation Digest.*]

An air traffic controller at flight control center Warrior traces the path of a UH-1 helicopter on radar along the DMZ in Korea

Reforger Firsts for the 59th

Story & Photos by
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ANOTHER NEW YEAR, another Reforger. But this year's reforger had quite a few firsts, especially for 5th Signal Command's 59th Air Traffic Control Battalion.

The 59th, formerly the 14th Aviation Unit (ATC), provided both Reforger forces, the orange and the blue, the vital air traffic control each side needed. Besides the normal services, each force required support for special maneuvers with a type of tactical aircraft.

Reforger forces were given four Stand-off Target Acquisition System helicopters, which use radar to trace vehicle movement on the ground. While SOTAS was within the Army's airspace—when taking off or landing and up to 300 feet in the air—the 59th was responsible for the aircraft. But when SOTAS flew higher into air space controlled by the Air Force (above 500 feet), the 59th coordinated with the Air Force to clear the aircraft. The Air Force had set up a control and reporting post near Schweinfurt, Germany, and the 59th colocated an FOC-Alpha there.

"FOC-Alpha was the nerve center for the air traffic control phase of exercise," said CPT Larry Kreps, from the command's ATC office in Worms, Germany. He explained that FOC-Alpha coordinated with the Air Force whenever Army aircraft had to leave Army controlled airspace for any reason—emergency or adverse weather conditions. Air Force aircraft would occasionally have to enter Army air space for a simulated artillery drop or medical evacuation, and would, of course, coordinate with the 59th.

Another site, FOC-Bravo, was set up to provide flight following services for the blue forces.

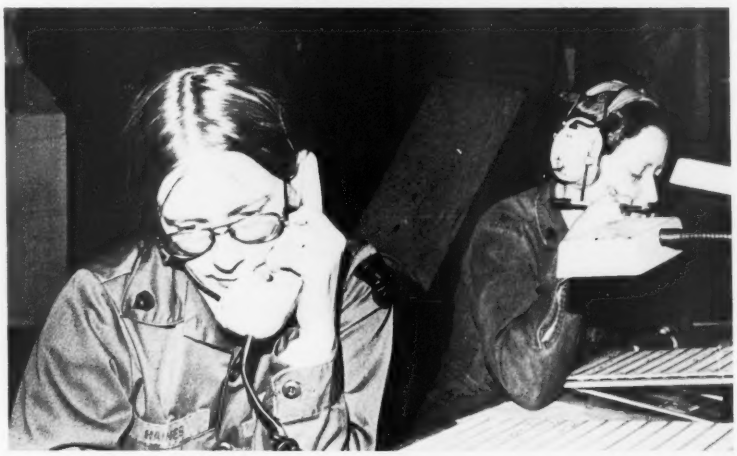
"Something new for Reforger this year was the en route corridors," CPT Kreps said. "If the weather conditions were below the Air Force visual meteorological standards, the 59th coordinated with the Air Force and then could clear Army aircraft under instrument flying conditions in what normally would be Air Force controlled airspace. The two en route corridors were KILO-A from Ansbach to Kitzingen and KILO-B from Kitzingen to Bamberg."

Aiding the FOC-Alpha and the neutral Kitzingen Army Airfield was experimental very lightweight air traffic management equipment. Staff Sergeant Patrick Fitzpatrick, ground control approach radar supervisor at Kitzingen, said, "On its illuminated radar screen it gives each aircraft in the area a code, identifying it as friend or foe, records the craft's altitude and distance from the airfield. The screen can be varied—concentrating on just one aircraft or on all craft in its range." SSG Fitzpatrick went on to say that the prototype was by far the best piece of ATC equipment the Army has developed in a long time and it was really impressive in operation.

Air traffic control is geared toward terminal operations (taking off and landing) and en route flight control. The 59th has its feet on the ground, successfully completing its mission daily as well as during Reforger.

At the Kitzingen Army Airfield, the 59th's 3d Platoon headquartered there provides the 3d Infantry Division with ATC services. The 3d Platoon operates a control tower,

SP5 Alice Haines (left) and SP4 Laura Askerman, tower operators with the 59th Battalion, relay flight information to Reforger aircraft and other ATC facilities. They set up with the Air Force command and reporting post and acted as the corps flight operations center



Acronym Key
Page 9

a ground controlled approach radar, a fixed beacon approach (pilot homes into its signal) and approach control (handing off aircraft from one controlling agency to another) and also coordinates with Army Flight Operations Detachment in Heidelberg.

For Reforger, the airfield became a neutral base and expanded its hours to service both orange and blue forces plus the umpires. Any time when a helicopter (or small fixed wing aircraft) wanted to land at Kitzingen, the tower transmitted to the pilot the barometric pressures, traffic conditions, etc. If it were late at night or the weather adverse, the tower turned the pilot over to the GCA radar.

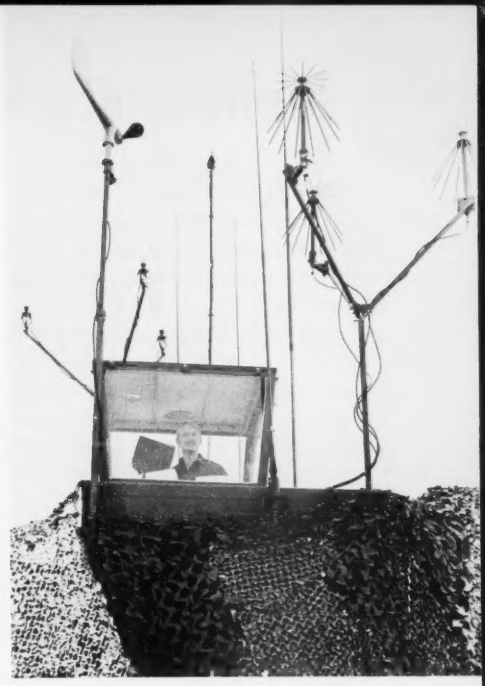
Also for their role in Reforger, Kitzingen received the VLATME and a priority tactical automated switching system, which enabled them to communicate with the other ATC sites. When it was necessary to get a call through to one of the remote sites for emergency reasons or to relay flight plans, they could use the priority override switch for fast, effective communications.

While Kitzingen was a fixed base performing Reforger missions, the 59th's sites set up in the field experimented with still more "firsts."

The tactical element isn't new—CPT Kreps explained that each platoon in the 59th has tactical equipment right now to set up tactical airfields.

"In the event of war, it would become necessary to leave a fixed airfield and set up a tactical airfield. ATC has mobile control towers, GCAs, FOCs and portable beacons (aircraft home into its signal) that can be set up in the field and powered by portable generators," he said.

For this Reforger, the 59th did something else a little different.



PFC Dale Johnson, a control tower specialist from the 59th, is ready to talk to any Reforger pilot who wants to land at the Bamberg tactical airfield. The tower, a ground control approach radar and a beacon approach can be set up in the field within 6 hours

They set up the field and drew up the instrument procedures and actually ran the flight checks. The final approving authority was USAREUR. In the past, these functions normally were done by a team from the Federal Aviation Administration.

The 59th set up a tactically instrumented airfield at Bamberg, which is normally an advisory airfield, telling pilots weather conditions. Sergeant First Class Gregory Swim, the acting platoon leader at the Bamberg site, boasted that they could set up a tactical airfield, run the flight checks, and be ready to function within 6 hours! Take down is a little easier, he said, only taking 4 hours.

As CPT Kreps praised the overall mission, Lieutenant Colonel Engle Scott, battalion commander, gave credit to the maintenance people who ensured all this new equipment and the old reliable equipment, too, stayed operational—despite the cold, cold weather and constant use.

For this year's Reforger, the 59th experienced a lot of "firsts," but, it wasn't the first time it successfully completed its mission.

SSG Phillip Brown, ground control approach specialist for the 59th, follows a Reforger aircraft on the radar screen as it approaches the Bamberg tactical airfield

ATC Facilities: The New Look

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IN THE 5 YEARS THAT there has been a single manager for U.S. Army air traffic control facilities, substantial improvements have been made.

Under the intensive management of the U.S. Army Air Traffic Control Activity, a subelement of the U.S. Army Communications Command, Ft. Huachuca, AZ, improvements have been made across the board and around the world in ATC facilities.

One program completed in October 1977 saw the installation of new generation radios at 45 ATC facilities in the United States, 26 in Europe and 9 in the Pacific area.

General communications-electronics upgrades included new interface wiring, installation of rehabilitated communications consoles and replacement of radio antennas. New tape recorders also were installed where needed. Any needed structural improvements were made before the C-E installations.

Another essential program, still in process, is replacement of all terminal very high frequency omniranges. The new state-of-the-art AN/FRN-41 replaces the obsolescent AN/FRN-22 which has been around for more than 20 years.

The first new unit was installed at the U.S. Army Signal School at Ft. Gordon, GA, during the latter part of last year. The first unit to be installed in the field was delivered to Libby AAF, Ft. Huachuca. It currently is in the last phase of installation and recommissioning.

Thirty new TVOR systems are scheduled to be installed at CONUS and overseas Army airfields this year. TVOR installations at Amadee AAF, Sierra Army Depot, and Seneca AAF, Seneca Army Depot, will incude the distance measuring equipment feature.

The most sophisticated ATC facilities being installed are the Army radar approach control systems at Ft. Hood, TX; Ft. Sill, OK; and Ft. Campbell, KY. The Ft. Sill ARAC (ASR-8 radar and ATCBI-5 interrogator) installation was completed and interim operation began on 22 September 1977.

The Automated Radar Terminal System-II portion of this system is scheduled to be completed in September 1979.

The Ft. Hood ARAC is in process of installation. The ASR-8, ARTS-II and the ATCBI-5 installation is scheduled to be in operation this spring. Until then, the Army is continuing to operate the Air Force mobile radar approach control (RAPCON, AN/MPN-14).

The Ft. Campbell ARAC project was picked up from the Air Force after ACC became responsible for operation and maintenance responsibility for ATC facilities at Ft. Campbell in December 1976. The Ft. Campbell ARAC will use the ASR-8 radar with the Air Force AN/TPX-42 interrogator system and Federal Aviation Administration's programable indicator display processor.

This installation is essentially equivalent to and in some respects surpasses the ARTS-II systems. The Ft. Rucker ARAC was commissioned in 1967 using the ASR-5, ATCBI-3 and the ARTS-III system. A current ACC update/enhancement project will include installing the newer ASR-8 and ATCBI-5 systems. The ARTS-III will be updated to the most recent ARTS-IIIA configuration.

Minimum safe altitude warning feature was installed in August 1977. These changes are being made with minimum interruption to normal operation. This updated system is scheduled to be in operation in the FY 1980 to 1981 timeframe.

New standard prefabricated control towers have been erected at Polk AAF, Ft. Polk, LA; Forney AAF, Ft. Leonard Wood, MO; and Wheeler AAF, Schofield Barracks, HI.

This type tower also is under construction at Marshall AAF, Ft. Riley, KS, and Ansbach AHP, Germany. At Ansbach only the standard tower cab portion will be used. It will be installed on the operations building. Available space located immediately below the cab in the operations building will provide rooms for the GCA operations fa-

Acronym Key
Page 9

cility and C-E equipment.

The new standard design also is scheduled to be installed at Godman AAF, Ft. Knox, KY; and Libby AAF, Ft. Huachuca, AZ, during FY 1979/1980.

This new tower is a special design developed by the Fort Worth District Engineer Office. It provides a hexagonal support shaft for increased strength at minimum cost.

Installation of C-E equipment in the completed towers is due to be accomplished during 2nd, 3rd and 4th quarters of FY 1979 at Polk AAF, Forney AAF and Wheeler AAF, respectively.

Transportable aircraft control central/towers (AN/TSQ-117) have been reconfigured/modified at Tobyhanna Depot and installed at AAF/AHP at Ft. Chaffee, AR; Yakima Firing Range, WA; Ft. Hunter Liggett, CA; Wertheim, Germany; Runkle, Ft. Rucker, AL; and Camp Stanton, Korea.

A transportable tower also will be installed at Wheeler-Sack AAF, Ft. Drum, NY, this year.

A third type of new control tower is scheduled to be installed at Redstone AAF, Redstone Arsenal, AL, and Troy Municipal Airfield (which is used for training in the Ft. Rucker area). This new tower is an adapted Navy type, is modular in design and offers the capability of being dismantled and relocated. The supporting shaft includes an integral base module and integral extender modules, i.e., for installation purposes it can be assembled with building block techniques and varied in height. These towers also are planned for Mackall AAF, Ft. Bragg, NC, and McCoy AAF at Ft. McCoy, WI.

A replacement nondirectional beacon for both tactical and fixed based use has been under development by the U.S. Army Materiel Development and Readiness Command. This dual configuration concept recently has been dropped in favor of a pure tactical NDB (AN/TRN-30) and a commercial fixed base NDB. Specifications for the commercial NDB were developed by FAA and also meet Army requirements. This new NDB will be compatible with existing antenna systems or there is the option of a single pole antenna system.

All new fixed based NDB systems will include new remote (no lines required) monitors. NDB systems will be installed in new fiberglass shelters where needed. Ninety-seven systems are scheduled to be fielded in CONUS and overseas during FY 1980 and 1981. This number includes dual NDB sites in Europe, training sites at Ft. Rucker and spare systems at direct and general support maintenance facilities.

Army ground controlled approach systems (AN/FPN-40) have been in use for more than 20 years with only few "piecemeal" product improvements. A new and comprehensive product improvement program will change 39 AN/FPN-40s (transmitter/receiver group and indicator group) to a solid-state configuration. This will include addition of a moving target indicator feature. This PIP currently is scheduled to be fielded during FY 1983. An additional PIP now is in the planning stage for addition of radomes to all GCA transmitter/receiver groups.

A fixed base microwave landing system has been under development by the FAA for several years. International technical complications have slipped this development schedule considerably.

The military has concurrently stated a requirement for an interoperable joint tactical microwave landing system. A Department of Defense study now in process will determine whether the military will develop and field a JTMLS which is interoperable with the FAA system. In such case the military may field a separate configuration to serve overseas fixed based and tactical requirements. FAA civil systems will be deployed in CONUS for Army fixed facilities.

In summary, ACC multimillion dollar improvement programs are providing a safe ATC operating environment throughout the system. This was long overdue and is well appreciated by the aviation community and all other users of Army ATC facilities.

The ARTS III is one of the most sophisticated pieces of equipment in the Army's air traffic control inventory. The computerized equipment takes much of the individual aircraft identification and position recording out of the hands of the controller

Air Crash Search & Rescue
Map Improvement

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TWO FACTORS led the Army Communications Command's Aeronautical Services Office to initiate its air crash search and rescue map improvement program.

- Satisfactory maps were not available in the field in many instances.
- Satisfactory ACS&R maps are recognized as a valid Army requirement by the Defense Mapping Agency.

The problem surfaced from field reports involving problems encountered complying with (or interpreting) directives relating to air crash grid map requirements. Among these directives are ARs 95-5, 95-26 and each airfield's preaccident plan. All call for the availability of convenient (size) maps clearly showing essential details needed to quickly locate downed aircraft. IG visits to the field (along with some other reports) revealed deficiencies in the grid map requirements area. This triggered an informal survey by USAATCA-ASO technical personnel in coordination with the DAIG staff. It revealed that local production of the grid maps too often was unsatisfactory. Some units were using road maps, county maps and outdated aeronautical sectional charts which do not contain enough detail to pick the best routings needed for timely executions of rescue efforts.

To be effective, grid maps must be in each aircraft, rescue vehicle/aircraft, control tower and base of operations at Army airfields. Local development and reproduction of enough good maps is required to ensure that uniform information is available to participants in crash rescue efforts. This capability is minimal, *or nonexistent,* in many Army aviation safety units.

Without proper grid maps, local aircraft in flight, specially equipped rescue aircraft or tower operators cannot effectively inform ground vehicles and trained rescue crews of the location of a crash site. Ground rescue parties have the expertise and equipment to save lives and to transport victims to areas where they can be airlifted to a hospital—if they can quickly get to the crash site.

Most aircraft accidents that occur off airfields crash in areas inaccessible to aircraft. But a rescue helicopter usually can land within walking distance. And, the installation of crashworthy fuel cells into a major portion of the Army's aircraft has virtually eliminated postcrash fires. This results in more people with crash injuries requiring lifesaving action. A U.S. Army Safety Center study shows that 25 percent (or 156) of the accidents it evaluated in a given period happened 1 to 15 miles from an airfield. Of 336 people aboard these aircraft, 35 percent received injuries; 22 percent were killed; and the rest were transported to medical centers.

Of the 156 accidents involved in the Safety Center's study, 53 percent occurred on airfields and the rest were widely scattered. These figures justify the development and use of the best possible tools for the lifesaving mission of search and rescue.

An overall assessment of the Safety Center's statistics indicates that a 1:100,000 scale map would be the most practical and convenient to serve the crash rescue mission requirements.

The Aeronautical Services Office was requested by safety officers to assist in upgrading the quality of grid maps to alleviate the problems discussed above. ASO responded with a field notice outlining the best way to obtain latest base maps from topographic depot resources.

The second factor—recognition of the ACS&R map program by the DMA—was prefaced by many supporting actions and documentation by the ASO/AI Division staff. These included visits/conferences at major installations, including Ft. Rucker, AL and Ft. Benning, GA, with interested safety officers attending from additional airfields to determine crash mission operational specifics and compile essential

Acronym Key
Page 9

data as a basis for the design and production of this new map concept.

The ASO subsequently conducted a field user survey among major airfield safety officers using a prototype map to ensure adherence to stated field objectives and needs.

The direct result of the ASO conferences and field surveys was the preparation of formal production specifications as the basis for developing a new standard Department of Defense ACS&R product.

Following this phase, ASO assisted the Office of the Assistant Chief of Staff for Intelligence and Defense Mapping Agency in determining criteria for and establishing a priority list of CONUS airfields for initial production schedules. These criteria addressed air traffic counts, training efforts and special mission aspects. ASO used data derived from AR 95-24 to support the air traffic criterion. A group of 33 Army airfields was selected by DAMI as warranting use of topographic production resources to produce a special ACS&R map to support airfield rescue missions. These were assigned first priority and the production effort was allocated by the DMA to its Defense Mapping Agency Hydrographic Topographic Center facility for action.

Principal highlights of the standard ACS&R map developed by the ASO/DMAHTC coordinated effort included the following features designed to specifically support the rescue mission:

- Quick and positive crash site identification and location for access by civilian and military fire, medical and crash rescue personnel.
- Rapid exchange of information between personnel involved in the rescue operations by distributing a common map to all authorized participants.
- Portrayal of all airfields, heliports, hospitals and hospital helipads.
- Facilitate crash, search and rescue coordination and planning by use of a standard map reference system.
- A simplified alphanumeric grid reference system designed for pinpointing crash sites and coordinating search operations is provided for use by local civilian rescue agencies, as well as military safety teams.

The current status of the USAATCA-ASO program comprises two phases.

The *first phase* marks the completion of 33 formal ACS&R maps produced under the high level standards of cartographic and production skills of the DMAHTC technical staff. These maps have been distributed to CONUS Army airfields with two provided to Alaskan units and one to Hawaii. As might well be expected, the "word" as well as the "deed" gets around.

Aviators from other Army airfields, as well as National Guard and U.S. Army Reserve aviators, have visited some of the 33 airfields possessing the standard ACS&R map. These visits have prompted direct inquiries to the USAATCA-ASO project manager.

The *second phase* dictates a requirement by the USAATCA-ASO to continue its basic mission of providing assistance to the field. In this case, ASO again has turned to the DMAHTC expertise through the Topographic Requirements Division to consider or explore varying levels of potential technical assistance to safety officers within DMA resources.

The object is to achieve a self-help program for these safety personnel, encouraging their maximum use, where available, of local skills, materiel resources and reproduction facilities to produce a provisional ACS&R map. The DMAHTC staff will make its map library source data available. This will be arranged through ASO liaison with field safety officers as outlined in ARs 95-5 and 95-26. Other technical assistance on the map compilation and possible reproduction aspects of this aid program also may be available.

The extent of this aid is being developed in coordination with the DMAHTC Topographic Requirements staff. It is expected that every effort will be made by DMAHTC to help as much as possible.

Many benefits will result from the ASO efforts in accomplishing the "standard" ACS&R map production. These include use of the principal map design elements involving the uniform grid system, and selection of salient map features which directly support the search and rescue mission.

USAATCA-ASO has obtained clear acetate overlays, one of which conveys the concentric circle overprint and the other an alphanumeric lattice locator grid. These were derived from the standard 1:100,000 scale format used on the DOD standard map.

Also involved is a base map which can be prepared at the local level using source material published at the 1:100,000 scale or, as necessary, reduced or enlarged to meet this desired (standard) scale format.

Using the acetate overlays, a composite completed map can be assembled for reproduction by local photo print or press facilities where available. These overlays will be obtainable from ASO on a loan basis to safety officers upon request.

Provided in modest quantities, these prints should be relatively inexpensive and significant savings should

Continued on page 18

ATC Reorganization

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A MAJOR REORGANIZATION of Army air traffic control units is placing all ATC functions under one manager.

The U.S. Army Air Traffic Control Activity, an element of the U.S. Army Communications Command, will be the single manager for all ATC functions, both tactical and nontactical.

ACC has been in the ATC business since 1973, when nontactical functions were placed under the Army's communications manager.

There are five types of ATC operations—management, tower and ground controlled approach which are terminal functions, en route and tactical terminal. Before last October ACC was involved heavily with the first three functions and somewhat involved in en route operations. The reorganization places ACC in the position of operating all five functions for most of the Army.

According to a USAATCA spokesperson there were problems with the former system, primarily in terms of effective use of personnel and equipment and variations in policy.

The present single manager concept will allow for the transfer and consolidation of equipment and positions and result in a small money saving for the Army. A definite gain in equipment development and standardization is anticipated.

The new concept, developed by ACC and the U.S. Army Aviation Center, Ft. Rucker, AL, provides for a unique modular building block structure of tactical en route, tower and ground controlled approach radar teams. The concepts and doctrine for the organization and deployment of these elements are outlined in FM 1-60, "Air Space Management and Army Air Traffic in a Combat Zone."

The changes in Europe are typical of the reorganization. The 14th Aviation Unit (ATC) was deactivated and reorganized as the 59th ATC Battalion under the 5th Signal Command, ACC's subelement in Europe.

The new battalion is comprised of three companies and an Army Flight Operations Detachment. The AFOD is the central point of contact for Army flight plans, search and rescue operations and coordinates with other services and Governmental agencies.

One advantage of the single manager concept in Europe is the ability to ensure North Atlantic Treaty Organization interoperability.

In Korea, the 284th Aviation Unit (ATC) and the 82d Signal Detachment were deactivated and the 125th ATC Battalion (Corps) was activated with two companies.

Further changes will go into effect in the United States this October with the formation of two battalions with four companies.

The reorganization continues into the Reserve forces with an ATC group headquarters, a battalion headquarters, and two companies to be formed in the National Guard and one company to be created in the Army Reserves.

Eventually, ACC will have Army ATC responsibilities in the theater of operations down through division level.

Continued from page 17

be accrued when compared with the cost of the initial standard map product.

The USAATCA-ASO project officer for the ACS&R map has made some preliminary visits to airfields to implement the technical assistance as outlined in the referenced ARs. These visits indicate that a need exists for some technical aid to make this "do it yourself" project a viable program. Requests for assistance may be directed by field activities to USAATCA-ASO, AI staff.

Recent comments by the Army aviation staff addressed the importance of the Army safety program. The USAATCA-ASO efforts reflected in the ACS&R project in support of aviation safety are considered complementary to the views and objectives stated by staff authorities.

AFOD in Germany

THE ARMY FLIGHT Operations Detachment operated by the 59th Air Traffic Control Battalion at Heidelberg, Germany, is the only AFOD in the Army's inventory.

The 64 military and civilian personnel of the unit provide flight planning support, flight coordination, flight services and emergency action support. The unit has been in operation since 1957.

The flight support normally associated with the AFOD was only a part of the services provided during 1978. The AFOD supported 12 aviation exercises in addition to flight service support to more than 76,000 flights.

The exercises ranged from Reforger and Albatross II, during which personnel were actually sent to the field to coordinate operations, to division and squadron size exercises where special procedures had to be developed and coordinated to support the training objectives.

Assistance to Army aviation covered everything from assisting in resolving alleged violations to support of downed aircraft. Problems and conflicts with civil versus military regulations and procedures also were resolved to give the Army aviator a more efficient and more responsive environment in which to train.

Improvements were made in Air Defense Identification Zone operations and in the instrument flight rules preferred routing system.

The last major area of support provided by the AFOD was in an emergency action role. Assistance was provided in expediting medevac and search and rescue support.

The AFOD consists of five sections and a U.S. Air Force weather detachment. The operations of each of the five sections—clearance, traffic, flight following, NOTAM and teletype—are described below.

The *clearance section* provides centralized control for emergency actions including both U.S. military and civilian and German civilian medical evacuations and search and rescue operations.

The German search and rescue center at Goch and the U.S. Air Force joint rescue coordination center at Ramstein Air Force Base are the AFOD's partners in all emergency missions.

In addition to necessary support, the AFOD ensures that search and rescue is alerted to prevent unnecessary searches and that civil authorities are informed in the event of damage for claims settlement.

Flight clearance and special planning assistance are also a part of the clearance section operation. In addition this section visits airfields and heliports in the U.S. Army Europe area to provide technical assistance for base operations personnel.

The *traffic section,* where most flight plans and air traffic messages are received and processed, is the heart of the activity at the AFOD.

Traffic section handlers receive flight plans and messages from base operations at Army airfields and heliports and submit them to the appropriate military or civil ATC organization.

Traffic handlers and routers are responsible for ensuring that all applicable flight regulations are complied with and safety practices are adhered to. The section also assists in conducting communications searches, working hand in hand with military and civil agencies to locate missing aircraft.

Flight following is the section most familiar to Army aviators flying under instrument flight rules and is responsible for ensuring the safe arrival of aircraft from the initial point of departure to the ultimate planned destination.

All arrival and departure messages are accurately annotated to the affected flight plan thus ensuring a positive means of determining the status of any aircraft. The flight plans of aircraft that are overdue at any planned landing point are investigated carefully to find the aircraft and find out why they were delayed or diverted.

The flight following section's close liaison with other ATC agencies gives them quick access to information and search and rescue assets. This section will normally be the first to discover that an aircraft is missing or down and will start communications searches.

The flight following section also accomplishes airspace and ADIZ coordination.

The AFOD's *Notice to Airmen section* provides briefings to USAREUR aviators for all inter- and intranational flight. In 1978 more than 15,000 NOTAM briefings were given.

NOTAM summaries and special notices also are prepared and sent to major Army airfields and heliports directly by AFOD teletype channels and via the command communications network at USAREUR headquarters.

This section ensures that all hazards to flight are published accurately

and immediately and are given the widest possible dissemination.

The NOTAM section maintains a complete and up to date aeronautical information publications library. The section provides interpretation of sometimes complex host country flight regulations.

The AFOD's *teletype section* is the single source for providing Army IFR flight plans to the civil ATC structure. The information is carefully screened and formatted for accurate input.

In addition, the teletype section passes PPR requests to bases requiring this, passes light messages and provides assistance in searches for missing aircraft.

The U.S. Air Force weather detachment provides 24-hour-a-day weather briefing service to Army aviators. In 1978 more than 70,000 weather briefings were given.

In calendar year 1978, more than 61,000 flight plans were processed by the detachment. Of these, in excess of 4,000 were more complex international flight plans.

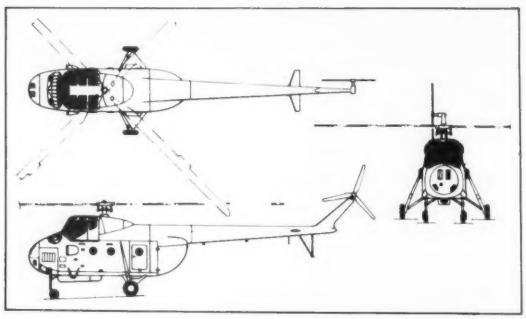
More than 900 medevac missions were handled and of this number, 65 required special or unusual coordination. A total of 37 search and rescue missions were coordinated through the AFOD.

The AFOD provides a unique service to Army aviation in Europe. The staff, well aware of its mission in promoting aviation safety, expends its most professional efforts in keeping its performance and the aviator's as flawless as possible.

THE THREAT

Soviet Aerial Minelaying

SOVIET AND WARSAW Pact countries have been experimenting with helicopters for laying mines. The Mi-4 HOUND helicopter is well suited for this purpose. It can carry up to 200 metallic antitank mines. The mines are sown via a chute attached to the side of the aircraft. This technique of mine laying gives tactical commanders a quick reaction capability for employing antitank and antipersonnel mines over a wide area.



Mi-4 HOUND

Reporting Final

FROM THE PENTAGON

National and International Aviation Related Awards. Requirements Directorate, ODCSOPS has the proponency for 13 civilian aviation related awards as listed in AR 672-2. ODCSOPS convenes a board of five officers (members of the board are aviators assigned to various elements in HQDA) to review and submit their recommendations to the Deputy Director of Requirements and Army Aviation Officer for approval. The majority of the awards (9 of 13) are reviewed during the period March through May, annually, with the remainder falling one each in February, July, October, and December. The awards are:

• **American Legion Aviator's Valor Award.** Action Month: March. Eligibility: Rated aviator who has accomplished a "conspicuous" act of valor or courage during aerial flight.

• **Frank Brewer Trophy.** Action Month: February. Eligibility: Individuals, groups, or organizations may be selected for outstanding contribution to the development of youths in the field of aerospace education and training.

• **Octabe Chanute Award.** Action Month: March. Eligibility: An individual making a notable contribution to the aerospace sciences or an engineering pilot.

• **Robert J. Collier Trophy.** Action Month: March. Eligibility: Persons, groups, or organizations who have demonstratively improved the performance, efficiency, or safety of air or space vehicles during the preceeding year.

• **Daedalian Aviation Award.** Action Month: March. Eligibility: Nominees are selected on the basis of demonstrated contribution to the advancement of safety in Army aviation during the preceeding fiscal year.

• **Harmon International Trophy.** Action Month: April. Eligibility: The awards (four) are presented to an aeronaut (lighter than air pilot), astronaut, aviator, and aviatrix who have shown exceptional aerial feats.

• **Norman P. Hayes Award.** Action Month: May. Eligibility: Nominee must have contributed to the advancement of navigation or have shown outstanding performance as a practicing navigator.

• **Helicopter Heroism Award.** Action Month: April. Eligibility: Two awards are presented to pilots, crewmembers, or other individuals who accomplished an outstanding humanitarian act of heroism, involving use of helicopters during the previous calendar year.

• **Kitty Hawk Memorial Award.** Action Month: October. Eligibility: Nominees (two awards) must have been of service to aviation and the aerospace field through life time achievement, contribution or recent act of valor.

• **James Martin Award.** Action Month: July. Eligibility: Native of the British Commonwealth, former countries of the British Commonwealth, or countries of NATO who have made a contribution to safer operation of military aircraft or the survival of aircrews of military aircraft. Alternatingly, for an act of valor in the air, when such an act has arising from it, subsequent action which leads to safe operation of military aircraft or survival of military crews.

• **Thomas L. Thurlow Award.** Action Month: May. Eligibility: Nominee must have made an outstanding contribution in invention, design, research, study, or advancement of science of air or ground navigation.

• **Paul Tissandier Diploma.** Action Month: April. Eligibility: The award is presented to those who have distinguished themselves in the field of aviation in general.

• **Wright Brothers Memorial Trophy.** Action Month: December. Eligibility: A Federal, state, or local government civilian, who is an American citizen, is awarded a trophy for significant public service of enduring value to aviation in the United States. **(ODCSOPS)**

JP4 to JP8 Jet Engine Fuel Conversion. The U.S. Army is fully committed to the program of converting all jet engine Army aircraft from JP4 to JP8 fuel, in an effort toward standardizing jet engine fuel use throughout NATO. Testing of Army helicopters was conducted and demonstrated a degradation of helicopter starting ability in cold weather, a condition which must be corrected before the conversion can be completed. **(ODCSLOG)**

AR 95-33 Lexicon. Here is your chance to get a head start on new language to be contained in AR 95-33:

• Full Mission Capable (FMC). Aircraft will be considered FMC when they can perform all missions.

• Partial Mission Capable (PMC). Aircraft will be considered PMC when they can perform one or more, but not all primary missions because one or more required mission subsystems are inoperative for maintenance or supply reasons. PMC is further defined as Partial Mission Capable-Maintenance (PMCM) and Partial Mission Capable-Supply (PMCS).

Partial Mission Capable-Maintenance (PMCM). Materiel condition status of an aircraft indicating a requirement for aviation unit maintenance (AVUM) or aviation intermediate maintenance (AVIM) repair or inspection.

Partial Mission Capable-Supply (PMCS). Materiel condition status of an aircraft, or subsystem identified in appendix A, indicating supply shortage to complete repair.

- Not Mission Capable (NMC). Materiel condition of an aircraft indicating that it is not flyable due to scheduled or unscheduled maintenance or non-availability of repair parts. NMC is further defined as Not Mission Capable-Maintenance (NMCM) and Not Mission Capable-Supply (NMCS).

Not Mission Capable-Maintenance (NMCM). The materiel condition of an aircraft indicating it is not flyable because of AVUM or AVIM requirements.

Not Mission Capable-Supply (NMCS). The materiel condition of an aircraft indicating that it is not flyable because maintenance needed to clear the discrepancy cannot continue due to nonavailability of required repair parts. **(ODCSLOG)**

Cargo Helicopters. As discussed at the Army Aviation Program Review last December, we are capitalizing on the capability and condition of the CH-54 fleet and retaining it in our inventory. The ongoing transfer of all Crane companies from the active Army to the National Guard will be completed by the end of fiscal year 1979. The Army will continue to fund modifications and product improvements to keep the CH-54A/B fleet in good condition into the 1980s.

The Army is about to begin two major Product Improvement Programs for the CH-47C fleet. One is to convert the T55-L-11D engine to the T55-L-712 configuration which will be the engine for the modernized Chinook (CH-47D). The other program will equip the CH-47C fleet with fiberglass rotor blades. These, too, will be on the CH-47D. The T55-L-712 engine improvements will rectify several major maintenance deficient areas and provide a contingency power rating which will permit operation at 4,600 horsepower for single engine operations. The first engines should be converted in the fourth quarter of FY 1981. The fiberglass rotor blades have completed a very successful flight test program and will start entering the inventory by the first quarter of FY 1982. In addition to increased damage tolerance, less noise, and better survivability characteristics, there is a significant improvement in hover performance and higher airspeeds can be achieved with improved cruise performance. Depending upon the conditions, performance gain at hover and cruise derived from the new blades ranges from 4 to 9 percent.

The CH-47D program is continuing ahead of schedule. Rollout of the first prototype occurred at the Boeing Vertol Plant on 6 March. First flight is scheduled for this month with Developmental Test/Operational Test II (DT/OT II) beginning in November. The CH-47D will provide improved reliability, availability, maintainability, productivity, safety and survivability, while achieving a single configuration in the field and providing a new 20-year life after modernization.

Self-deployment of CH-47C/D helicopters to Europe currently is being addressed by TRADOC, DARCOM, and FORSCOM. The AAPR 78 concluded that because of the critical shortage of air and surface transportation assets, the means to achieve self-deployment of CH-47 helicopters should be pursued. A Letter Requirement for Extended Range Fuel Kits, completion of a Concept Evaluation Plan, development of a Basis of Issue Plan for extended range fuel kits, evaluation of the requirement for additional CH-47 navigation systems, and preparation of an operational plan are some of the actions required to complete the evaluation. Self-deployment of the 179th Medium Lift Helicopter Company in FY 1980 is being considered. **(ODCSRDA)**

Noncommissioned Officer Logistics Program. Attention Logisticians! Are you looking to get ahead? Why not consider applying for the NCO Logistics Program? Latest statistics from the just-released promotion list to E-8 reveal that members of the NCOLP faired much higher than their contemporaries Armywide. Figures indicate that while the Armywide selection rate was 28.8 percent in the primary zone, members in the logistics program had a 60 percent selection rate. Secondary zone selections were even better. With an 18 percent selection rate for our logisiticians versus a 5.6 percent selection rate Armywide, obviously the NCO Logistics Program is the path to take. If these figures impress you and you think you might be interested in this most prestigious club, read Chapter 13, AR 614-200 or call SFC Morrow at MILPERCEN, AV 221-8026/8027. **(MILPERCEN)**

FROM FORT RUCKER

Army Surge. The Aviation Center is preparing for a proposed increase in its training of Army aviators beginning in October of this year. The increase is pending final Department of the Army approval. Expansion of the Army program will continue over the next several years and could ultimately result in between 450 to 480 more students per year being trained over the programed 1979 input of about 1,300. If the expansion for Army aviators is

approved, creation of more than 500 positions and an increase of $24 million in salaries, services, and supplies generated at the installation will result.

The need for additional Army aviators has been created by the requirement for greater numbers of junior grade officers to pilot the increasing number of helicopters in the Army and to meet the concepts for employment of these helicopters in the national defense.

The largest increase in training responsibility for Ft. Rucker will begin next January when, subject to Congressional approval, the training of Navy, Marine, and Coast Guard helicopter pilots is scheduled to begin. While the Air Force already has its pilots trained at Ft. Rucker, efforts to achieve consolidation of the other services' training have been unsuccessful in Congress for the past 3 years. Consolidation of all services' helicopter training at the Aviation Center has been recommended to the Congress by the Department of Defense, with endorsement by both the secretaries of the Army and Navy. Independent studies in the past have projected a savings of $100 million over a 5-year period if consolidation was achieved.

The transfer of training must be completed in fiscal year 1980 in order for the Navy to close out its rotary wing program at Whiting Field, Pensacola, FL, during that budgetary year. This will mean a student input increase at Ft. Rucker of between 450 and 500 in calendar year 1980. To accommodate this increase, about 400 additional personnel, military and civilian, over and above the proposed increase due from additional Army training, will have to be added to the training staff at Ft. Rucker. The increase in training due to consolidation will represent an additional $30 million in the post's operational expenditures.

It should be noted that the personnel and expenditure figures for the Army increase and the consolidated training are independent of each other and neither represents the approximately 700 civilian personnel that flight and maintenance contractors at Ft. Rucker will have to hire to meet these increased responsibilities to provide needed service to the flight program. **(USAAVNC-PAO)**

Black Hawk Arrives. **Cooperation between the Army and industry lies behind the UH-60 Black Hawk, speakers said 25 April at Ft. Rucker's acceptance ceremony for two of the new aircraft.**

Ft. Rucker's commanding general, Major General James H. Merryman, said: "The Black Hawk has become a reality through the team effort of Army and industry. It literally represents one of the most successful efforts in the history of research and development."

The Black Hawk was further identified as the first aircraft which was defined and developed specifically to meet Army airmobility needs.

Mr. Gerald J. Tobias, president of Sikorsky Aircraft which had the Black Hawk contract, also lauded the team effort. He noted that more than 3,500 suppliers in 43 states made a large contribution in bringing the helicopter to production.

"Our entire Black Hawk team takes a great deal of pride in this accomplishment," Mr. Tobias said. "There's a total of about 6,000 hours of combined ground and air tests on this aircraft, making it the most tested one in the history of any service."

The UH-60 is designed to carry 11 fully equipped troops plus a crew of 3. Its large cabin also can be used for many secondary missions, including medical evacuation and troop resupply. For external lift missions, the Black Hawk has a cargo hook capacity of 8,000 pounds.

It has two 1,543 horsepower engines and a top speed of 170 knots. Its fuselage is 50 feet long and 7 feet, 9 inches wide.

The Black Hawk, equipped with wheels rather than skids, has a four-blade main rotor with a diameter of 53 feet.

FROM FORT EUSTIS

SQT Notice Distribution, Attention TCOs. Many Soldiers have complained that they have not received their SQT Notices. There is no one sure way of ensuring that Soldiers receive and keep their notices. Review your procedures. Take a look at Procedure 3-3, DA Pam 600-8 for some help that is available from local resources. Work with the AG inprocessing shop and ensure that all incoming Soldiers are interviewed about the SQT Notices. Work with your commanders and help them follow up when Soldiers arrive at the units. Don't forget to develop a system protecting the Soldiers at their new unit when they depart on PCS. Develop a total system for SQT at your post—you are the TCO, it's your job. **(USATSC)**

Readers Help Build

IN THE OCTOBER 1978 issue of *Aviation Digest* a questionnaire was published in the article "You Can Help Equip the ASH," requesting that readers help select the mission equipment package for the advanced scout helicopter (ASH). The questionnaire was designed by the ASH Special Study Group (SSG) to obtain subjective data in several controversial and critical areas. The data obtained are being used to revise and update the ASH required operational capabilities (ROC).

The response from the aviators in the field was excellent, totaling 241 questionnaires returned. Most respondents had written much more than the SSG expected about ASH missions and design concepts—including as many as five type-written pages explaining the rationale for their selected mission equipment packages.

Two of the questionnaires returned included resumes for a job with the ASH Training and Doctrine Command Systems Managers Office. (Sorry folks, we do not have any projected vacancies for quite a while.)

The responses represented experience levels from zero to more than 2,000 hours of light observation helicopter (LOH) flight time. Most aviators completing the questionnaire had LOH experience, and many had flown the LOH in combat.

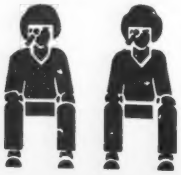
Commanders and former commanders of units employing LOH were included among the respondents. Additionally, all the instructor pilots of the Aeroscout Branch, Directorate of Training at the U.S. Army Aviation Center completed the questionnaire.

In the questionnaire participants were asked to project themselves into the 1985 timeframe and select a mission equipment package for the ASH. Each questionnaire participant was instructed to select 1,000 pounds or less of mission equipment from a total package of 29 items, which weighed 2,704 pounds. Each person was asked to prioritize those items in the 1,000 pounds of equipment. The number of responses for each item of equipment and the priority assigned was statistically evaluated. The list in figure 1 is the priority ranking that resulted from the evaluation of all returned questionnaires.

It indicates that the respondents primarily were concerned about air-

Seating

Seventy percent recommended side-by-side seating. The participants indicated that side-by-side seating facilitates crew communications by their being able to coordinate with hand signals and also simplifies cockpit design by common usage of various instruments and other aids. Many who selected side seating believed that this configuration afforded better observation than tandem seating. Twenty-five percent recommended tandem seating, their reasoning being that such an arrangement offers a slim frontal profile and affords both crewmembers good observation. Five percent selected single seating in an effort to keep the aircraft as small as possible.



Ability to Carry Passengers

Fifty-nine percent recommended that the ASH not have the capability to carry passengers. Keeping the ASH small and avoiding transporting VIPs were the main objections to having a passenger-transporting capability. Forty-one percent stated that the ASH should be capable of carrying passengers. Those desiring passenger-hauling capabilities indicated that rescue of downed crews and transport of VIPs were primary considerations.

Armament

Eighty percent indicated that the ASH should definitely be armed. The reasons for arming the ASH included self defense, killing tanks and shooting enemy helicopters down. Twenty percent preferred an unarmed ASH. It is interesting to note that, when given a list of 29 candidate systems for the ASH and being constrained to 1,000 pounds of mission equipment, no armament system made the top 15 systems.

An ASH

Major Michael McClellan
TSM — ASH Office
Fort Rucker, AL

See October 1978
YOU CAN HELP
Equip The ASH
Aviation Digest

1. APR-39
2. Mast-mounted sight (TADS)
3. PNVS
4. Auto Tgt Handoff
5. ASN-128 (Doppler & PMD)
6. KY 58 (Secure Voice)
7. HF-SSB
8. AN/ARV-2 (Laser Warning)
9. ALQ-144 (Infrared Jammer)
10. IACS
11. ALQ-136 (Radar Jammer)
12. Radar Alt
13. TADS-nose mounted
14. ARC-164 (UHF)
15. ARC-186 (FM & VHF)
16. 7.62 armament
17. IHADSS
18. IFF/SIF
19. IFF APX-100 (Transponder)
20. TAC beacon
21. Missiles
22. EMMADS
23. HSI
24. KY-75-secure voice HF
25. CONUS nav
26. M-130 (chaff/flare)
27. Hover hold
28. 30 mm armament
29. Wheels

Figure 1

craft survivability components, target acquisition devices, a builtin pilot's night vision device, and communication equipment. Based on a mission equipment package of 1,000 pounds, no armament would have been available for the ASH. The priority indicated influenced the mission equipment package established by the ASH Special Study Group.

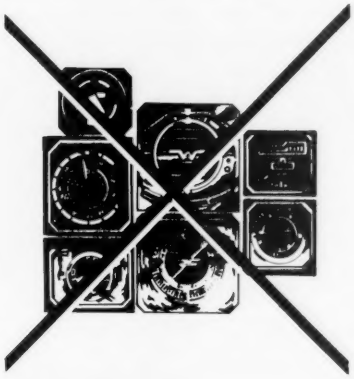
The questionnaire also asked for responses concerning aircraft configuration. The percentage of participants favoring a particular configuration and their reasons for doing so are at the bottom of pages 24 and 25.

Additional salient comments were gleaned from the questionnaires of those respondents who took the time to provide innovative ideas or suggestions to the ASH SSG. Since these comments were outside the purview of the basic questions, no statistical analysis could be made; however, they were deemed valid and considered by the ASH SSG. Figure 2 lists the most mentioned innovative ideas or missions.

Figure 3 is a list of design concepts the participants believed should be considered for the ASH and figure 4 summarized the results of the en-

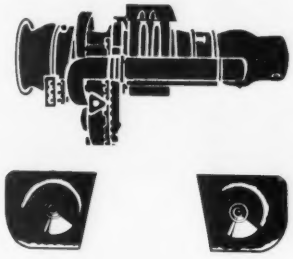
CONUS Navigation Package

Seventy percent believed that an ASH designed to fly nap-of-the-earth (NOE) did not require a CONUS navigation package. Thirty percent believed that the ASH should have CONUS navigation equipment.



Engine Requirements

Fifty-three percent selected a twin engine ASH. The reason stated was survivability if one engine were lost. Forty-seven percent recommended the single engine over the twin engines because of concern about weight, cost and simplicity.



Wheels Versus Skids

Sixty-six percent selected skids because they weigh less, require less maintenance, and are better suited for parking in rough terrain. Thirty-four percent recommended wheels so that aircraft could be ground handled with less difficulty.

Design ASH to be Scout, not ASH & TRASH	Air to air
Equip with loudspeaker for talking to ground troops without landing	Do not use for command and control
Kill tanks	Decoy missions
Aircrew rescue	Courier
Radio relay	Equip with metal detector
Convoy cover	Suppress enemy radar
Antisubmarine	Resupply
Arm to infiltrate enemy rear	Arm and employ in swarm (mass)
Wire cutting	Medical evacuation
Command and control	Forward air controller
Damage assessment missions	Float in water—speed in water comparable to speedboat

Figure 2

Keep it simple	Powerful
Keep it inexpensive	Crashworthy
Keep it reliable	Stirrup pedal
Black box	Rotor brake
Design it to be quiet	Jettison type canopy
Comfortable to reduce fatigue	Fast

Figure 3

tire questionnaire.

The ASH SSG thanks those who took the time to complete the questionnaire. The information you provided will be used to help revise and update the ROC, which has now been distributed for initial staffing. Hopefully, the ultimate ASH will incorporate the mission equipment package included in the ROC. With this mission equipment package the ASH would be able to acquire targets and interface with the advanced attack helicopters and other modern systems of the future.

To survive and be effective in the future, the ASH must have the capability to operate and detect targets during the day and night and under adverse weather conditions. The ASH also must have an effective NOE communication system and modern aircraft survivability equipment.

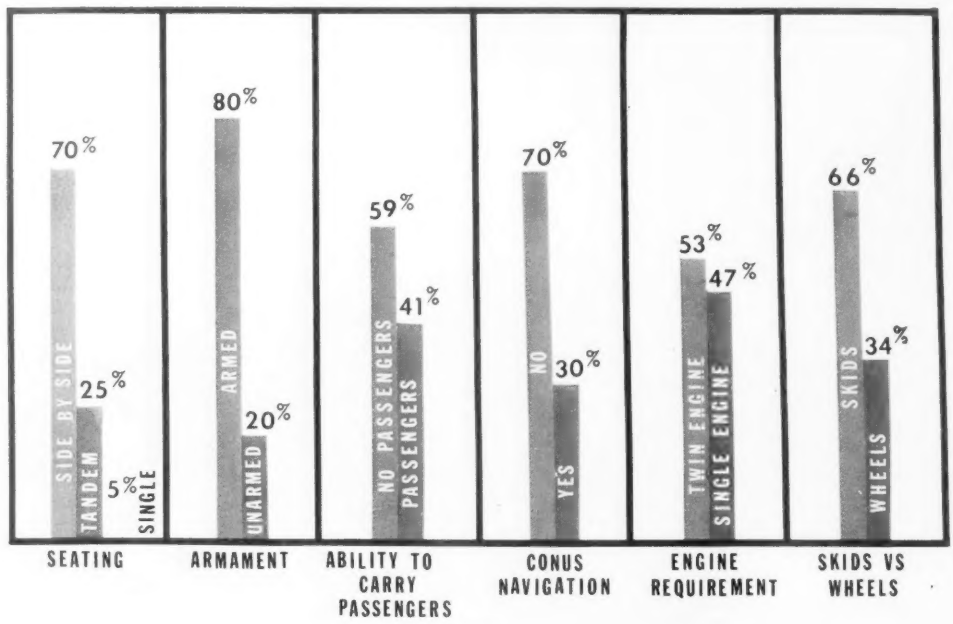


Figure 4

Captain Henry Scheuer
Flight Commander
Department of Flight Training
Fort Rucker, AL

RAD Survey—Who, Me?

LT BOB JONES WAS still a bit dazzled from the nuclear blast which had just occurred to the northeast of the troop's location, when he got word that the operations officer wanted to see him immediately. As he approached the operations tent, the operations officer was standing next to the entrance.

"Sir, LT Jones. I understand you wanted to see me." The operations officer turned toward Jones.

"Yes, LT Jones. You have a mission. You are going to conduct an aerial radiological survey for squadron. Get your observer and the equipment you require and get up to squadron headquarters now. The squadron NBC (nuclear, biological, chemical) officer will be waiting to brief you. If no questions, then good luck!"

Stunned, LT Jones turned to walk away. Radiological survey? How do you do that?

Students of the new initial entry rotary wing 175-40 aeroscout program at the U.S. Army Aviation Center, Ft. Rucker, AL, are given the following teaching test to help prepare them to conduct surveys. It can be adapted easily for use by field aviation units to help alleviate some of the mysteries of aerial radiological surveys.

FM 3-12 and FM 21-40 are the primary references for the exercise. Answer each question before continuing. Answers are on page 31.

Questions

Situation: You are in a combat situation where you have been told that use of nuclear weapons is possible. Your unit (an air cavalry troop) currently is conducting a rear area security mission as a part of a larger force. Suddenly you see a tremendous flash of blinding white light. You are standing next to a ditch.

1. What should be your immediate reaction?

* * *

Luckily, the blast was far enough away that it did very little damage. After remaining down for more than 2 minutes, you check around you to ensure everyone is all right and the equipment is not damaged. Somehow you had presence of mind to count the flash to bang time and determined that it was about 100 seconds. You report this to your operations officer, who, being very busy, asks you to prepare an NBC 1 report.

You know that you are at coordinates FK 265595, and by using a compass you determine the direction to the center of the mushroom cloud is 060 degrees. At 5 minutes after the burst (which occurred at 0845 hours local) you measure the cloud width angle to be 4 degrees (again using the compass). The very dark cloud appearance indicates that the burst was either a surface or subsurface burst (for reporting purposes it is a surface burst since there is a sizeable cloud). If the cloud had been almost white in appearance and did not touch the earth surface, you would have known that the explosion was an air burst. Today is 10 June 1982.

2. Write the NBC 1 report you would prepare for the operations officer.

* * *

About 30 minutes later, the troop receives an NBC 3 report which indicates areas of *expected* contamination. The NBC officer plots the information and says the fallout is not expected at your location. It was at about this time that the operations officer notified you to get what equipment you need for an aerial radiological survey, and to get up to squadron headquarters for a briefing. You notify your aerial observer and go to pick up the required equipment.

3. What is an aerial radiological survey?

4. What equipment is required to conduct an aerial radiological survey, other than the aircraft?

* * *

You arrive at the squadron tactical operations center (TOC) and locate the squadron NBC Officer. Following are excerpts from his briefing:

a. "The burst you witnessed about 2 hours ago was a surface burst, occurring generally in the vicinity of Newville (FK 580770), an intersection of several major highways and railroads in the division rear area. The burst was estimated to be about 5 kilotons. Fallout should be complete within 30 minutes. Your mission is to conduct a detailed aerial radiological survey, using the course leg technique.

b. "The *turn back dose* is 75 rad (roentgen). The *turn back dose rate* is 240 rad/hour.

c. "I would like the survey to be flown no higher than *150 feet AGL* (above ground level) and at a speed not to exceed 50 knots *ground speed.*

d. "Make sure that the distance between aerial readings does not exceed more than 500 meters. A reading every 15 seconds should be sufficient. Make a minimum of 10 readings between checkpoints.

e. "Take air-ground correlation data for at least every other course leg flown. However, *if possible,* complete all the course legs prior to landing for the ground data, to keep the aircraft contamination free for as long as possible. Air-ground correlation factor data should be taken where aerial and ground dose rates can be read most accurately on the survey meter, for example, in the dose rate range of 5 to 10 rad/hour.

f. "Return here with your results as quickly as possible. Here is an overlay of the course legs you are to fly."

5. As you can determine from the briefing, your mission is to conduct a "detailed aerial radiological survey." Briefly discuss the difference between a detailed aerial radiological survey and a simplified aerial radiological survey.

6. Briefly describe the course leg technique.

* * *

As you noticed in subparagraph a of the briefing, fallout was estimated to be complete in 30 minutes. After a surface nuclear burst most contaminated particles in a radioactive cloud rise to considerable heights. Thus fallout may occur over an appreciable area and it may last for an extended period of time. (This time can be estimated fairly accurately.) A survey conducted before fallout is complete would be inaccurate because contaminants would still be suspended in the air. For this reason, as well as being hazardous to surveying personnel, radiological surveys should not be accomplished before completion of fallout.

Subparagraph b of the briefing discusses turn back dose and turn back dose rate. Both of these are determined by command decision prior to the survey. Turn back dose is the *total amount* of radiation actually absorbed by individuals. At that *dose* or amount of radiation, surveying personnel will turn back to avoid exceeding the operation exposure guide (OEG)—see FM 3-12, chapter 4, paragraph 4-4 for a discussion of OEG.

7. What instrument is used to measure total dose?

* * *

Turn back dose *rate* is the radiation dose absorbed per unit of time, commonly measured in rad per hour. At this predetermined dose *rate,* surveying personnel will turn back or leave the contaminated area as quickly as possible to avoid undue exposure hazard. It should be noted that turn back *dose* and turn back *dose rate* are two entirely separate items, determined from different instruments, and neither one should be exceeded.

8. What instrument is used to measure dose rates in aerial radiological surveys?

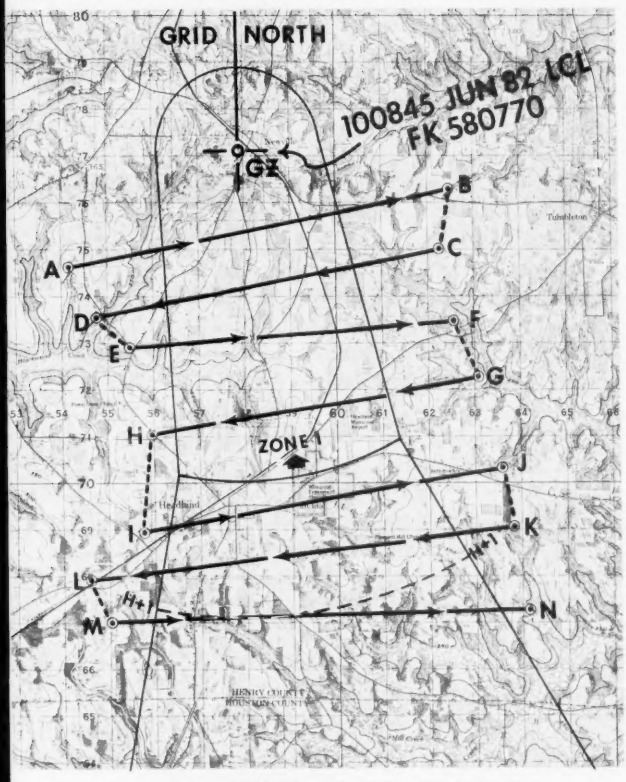
* * *

Subparagraph c of the briefing discussed aircraft altitude and speed. As you noticed, you were told to fly the course legs *no higher than* 150 feet above *ground level.* Several considerations go into this determination. First, the higher the aircraft is flown, the less radiation hazard there is to the survey party.

Second, the higher the survey is flown, the *less* accurate is the information which is obtained. The pilot has the option of flying the course leg lower if desired, or if it is required by the tactical situation. The important thing to remember is that all of each course leg is flown at the same altitude or height above the ground. (Every course leg can be flown at a different altitude if desired.)

(Note: A height of 60 meters (about 197 feet) is considered the optimum altitude AGL for conducting aerial radiological surveys. This is considering the trade off between accuracy of the survey versus exposure of survey personnel.) Since the OH-58 Kiowa does not have a radar altimeter, the pilot must do a detailed map reconnaissance of each course leg to be flown and establish several average altitudes which are read on the altimeter. This would not be necessary flying "NOE" or "Contour" since the pilot could very easily estimate the altitude AGL for each course leg.)

You were told not to exceed a speed of 50 knots ground speed. This is because of the slow response time of the *radiacmeter* which is inaccurate above 53 knots ground speed. Also, the slower the aircraft



Overlay depicting course leg technique

speed, the more accurate the results. Remember, to determine ground speed, winds must be evaluated. A *constant* ground speed for each course leg is required for accurate results.

9. What indicated airspeed and heading should be flown to maintain a 40 knot ground speed and desired course leg heading under the following situations. (Normally indicated airspeed (IAS) would have to be adjusted to true airspeed (TAS) depending upon the type aircraft. For this question, assume that *IAS = TAS.* Also, remember that winds aloft given by weather are given in *true* north, the RBHI, RMI or magnetic compass all give directions in *magnetic* north, and map headings are in *grid* azimuths. Therefore, the map declination diagram would have to be consulted to determine correctly the variation adjustment for proper course heading. For this question, assume there is no variation between true, grid and magnetic headings.)

- Course leg heading to be flown is 090 degrees, wind is out of 060 degrees at 10 knots.
- Course leg heading to be flown is 180 degrees, wind is out of 270 degrees at 15 knots.
- Course leg heading to be flown is 030 degrees, wind is out of 210 degrees at 5 knots.

(Note: Use air navigation computer)

* * *

Subparagraph d of the briefing discussed the distances between aerial readings. This is determined by time between readings which is then converted into ground distance through the use of the *constant* ground speed. As stated, a reading should be taken so that distance between aerial readings does not exceed 500 meters, and that a reading taken every 15 seconds should be sufficient. This can be computed as follows: 50 knots ground speed equals 92 kilometers per hour. Using the air navigation computer, at 92 kilometers per hour ground speed, the aircraft will travel 1.54 kilometers in 1 minute. 1.54 kilometers divided by 4 (one-fourth of a minute or 15 seconds) is equal to 385 meters. Therefore, if a reading is taken every 15 seconds at a ground speed of 50 knots, it would convert into a reading being taken every 385 meters—well within what is desired by the squadron NBC officer. (Note: The shorter the time interval between readings, the more accurate the results. Also, for increased plotting accuracy, at least 10 readings along each course leg or route are desirable.)

Subparagraph e of the briefing discusses air-ground correlation factor (AGCF) data. An AGCF is required for calculation of ground dose rates from aerial dose rates taken in an aircraft during a survey. It is the ratio of a ground dose-rate reading to a reading taken at about the same time in an aircraft at survey height over the same point on the ground. Two techniques for obtaining the air-ground correlation factor are:

- The preferred technique is by direct determination of ground and aerial dose rates during the survey and subsequent calculation of the AGCF. The procedure for determining the ground dose-rate reading involves landing near the selected point. The monitor proceeds to that point and takes the ground dose rate reading, using normal monitoring procedures. AGCF data are obtained if possible for each two to four course legs or routes flown. The sites for obtaining AGCF data should be selected to approximate average foliage and ground surface conditions in the contaminated area. Accuracy of this AGCF data as to position, height above ground, and dose-rate is of primary importance. New data must be obtained when survey height changes by 15 meters (50 feet) or

more, when ground foliage or average ground surface conditions change significantly, if the aircraft or the survey meter is changed, or if weather conditions change drastically during monitoring.

• When the tactical situation, terrain conditions, high radiation dose-rates or other factors do not permit the use of the preferred technique, AGCF may be obtained by referring to FM 3-12, paragraph 4-11b. (Note: Air-ground correlation factors for the OH-58A Kiowa are under development for use with this method.) *This method should only be used if the preferred technique cannot be used.*

In the situation given, you were told to take air-ground correlation data for at least every other course leg flown. Remember, if the survey altitude changes by more than 50 feet, another AGCF must be determined. Also, if possible, all of the course legs should be completed prior to landing for the ground data. If this is done, each air dose-rate over the designated point on the ground should be made at survey height for that particular course leg immediately prior to landing.

The AGCF may be calculated as shown below, using the aerial dose-rate taken at survey height and the ground dose-rate.

Ground dose-rate = 20 Rad/Hr

Aerial dose-rate (Taken at course leg survey height) = 5 Rad/Hr

Air-ground correlation factor =

$$AGCF = \frac{\text{Ground Dose Rate}}{\text{Aerial Dose Rate}} = \frac{20\ \text{Rad/Hr}}{5\ \text{Rad/Hr}}$$

AGCF = 4

Then by multiplying all of the course leg readings taken in the aircraft at survey height by the air-ground CF (4), the ground level reading can be estimated.

10. Determine the following air-ground correlation factors:

a. Ground dose-rate = 75 Rad/Hr
Aerial dose-rate = 10 Rad/Hr

b. Ground dose-rate = 45 Rad/Hr
Aerial dose-rate = 9 Rad/Hr

c. Ground dose-rate = 40 Rad/Hr
Aerial dose-rate = 10 Rad/Hr

* * *

Armywide, one form is used to record data obtained using either the route or course leg technique.

11. What is the form used to record route or course leg aerial radiological survey data?

* * *

Headings provided in the blocks of this form are self-explanatory. Any heading not applicable to the situation may be lined through by the monitor. The "remarks" block is used by the monitor in providing any additional information that will be of value to the control party.

The survey data collected are delivered to the control party (squadron NBC officer) at the completion of each aircraft mission by physical drop, radio or telephone from the nearest landing area. If communications equipment is available, the data may be transmitted by radio directly to the control party as the survey is being conducted. (Note: Survey data is *very important, sensitive* intelligence information, and must be safeguarded closely to avoid disclosure and possible use of the information by the enemy.) In our situation the information was to be returned physically to the squadron NBC officer, who would then process and forward the information to division. So far, the discussion and situation have been limited to the route and course leg technique of aerial radiological surveys.

12. What is the other technique used to conduct an aerial radiological survey?

* * *

You successfully completed the survey and returned to the squadron TOC. The squadron NBC officer was waiting to debrief you and had a survey and monitoring team standing by to check you and the aircraft for radiological contamination.

13. What instrument is used to monitor personnel and equipment for radiological contamination?

* * *

While you were being debriefed an NBC decontamination team was decontaminating (washing) your aircraft and flushing the compressor to rid it of any contamination.

For your efforts and the few rad you absorbed, you took a shower and received fresh clothing to replace your contaminated Nomex.

Considering the doctrine and training of enemy forces, the use of tactical nuclear weapons could become a reality on some future battlefield. Most Army aviation units have aerial radiological survey as part of their mission statements. Why not start training now so that you won't get caught short like LT Jones?

Aerial Radiological Survey

Answers

1. a. Move no more than a few steps to seek cover.

b. Drop flat in the ditch, facing away from the fireball.

c. Close your eyes.

d. Protect exposed skin from heat rays as much as possible (put hands and arms near or under your body and keep helmet on if possible).

e. Remain down until the blast wave (if any) has passed and debris has stopped falling.

f. Stay calm, check for injury, check weapons and equipment for damage, and prepare to continue the mission.
(Reference: FM 21-40, page 3-2)

2. Line B. FK 265595 (should be encoded)
Line C. 060 degrees magnetic
Line D. 100845 June 82 Local
Line H. Surface
Line J. 100 seconds
Line L. 4 degrees
(Reference: FM 21-40, chapter 6)

3. A radiological survey is a *directed effort* to determine the extent and dose rates of radiation in an area. (Reference: FM 3-12, page 4-1)

4. a. Instruments for measuring dose rates. The radiacmeter IM-174A/PD will be used for measuring dose rates. The IM-141/PDR-27J radiacmeter is more suitable for measuring low dose rates in old contaminated areas. (Note: The IM-174/PD is standard B). Ensure that you have fresh batteries.

b. Instruments for measuring dose. A dosimeter, such as IM-93(*)/UD must be carried for purposes of radiation exposure control. The instrument should be zeroed properly before use.

c. Radiological Data Sheet. DA Form 1971-1-R for *route or course leg* aerial radiological survey; DA Form 1971-R for *point* aerial radiological survey.

d. Watch. Either a watch with sweep second hand, a stop watch or an operable aircraft clock is required to time the intervals between readings.

e. Communications. Radios as required.

f. Maps. Maps of the land areas to be surveyed should be available for the survey party.
(Reference: FM 3-12, pages 4-13 and 4-14)

5. The simplified aerial radiological survey is designed to provide the minimum essential information for evaluating the contamination hazard. The detailed aerial survey provides sufficient information for the preparation of a detailed radiological contamination overlay. (Reference: FM 3-12, page 4-2 and 4-3)

6. In using the course leg technique, the pilot flies a straight line course (course leg) between two checkpoints. The pilot maintains as nearly as possible a constant height above the ground, a constant ground speed, and a straight flight direction between the starting and ending checkpoints of each course leg. When the dose-rate information obtained from use of this technique is processed, the result is a series of ground dose rates spaced at equidistance intervals along the path over which the aircraft was flown. (Reference: FM 3-12, page 4-3)

7. Dosimeter IM-93(*)/UD. (Reference: FM 21-40, page B-16; or FM 3-12, page 4-13)

8. Primarily, the IM-174A/PD. Occasionally, the AN/PDR-27 may be used. (Note: The IM-174/PD is standard B.)
(Reference: FM 3-12, page 4-13)

9. a. IAS — 48 knots; heading — 84 degrees
b. IAS — 43 knots; heading — 200 degrees
c. IAS — 35 knots; heading — 030 degrees

10. a. CF = $\frac{\text{Ground dose rate}}{\text{Aerial dose rate}} = \frac{75}{10} = 7.5$
b. CF = $\frac{\text{Ground dose rate}}{\text{Aerial dose rate}} = \frac{45}{9} = 5$
c. CF = $\frac{\text{Ground dose rate}}{\text{Aerial dose rate}} = \frac{40}{10} = 4$
(Reference: FM 3-12, pages 4-6 and 4-7)

11. DA Form 1971-1-R. (Reference: FM 3-12, page 4-3)

12. The "point technique." (Reference: FM 3-12, page 4-3 through 4-6)

13. AN-PDR-27(*). (Reference: FM 21-40, pages B-15 and B-16)

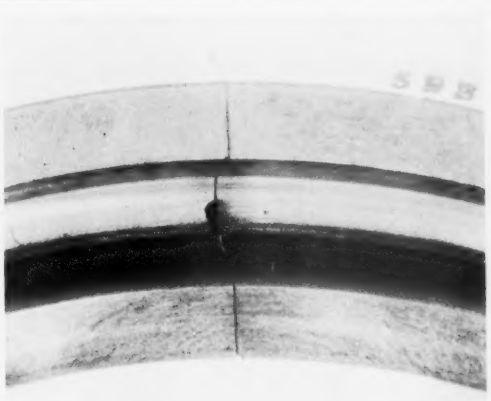
U.S. ARMY SAFETY CENTER

Vibration and the T63 engine

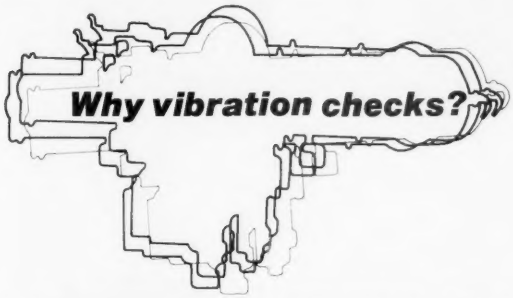
FILES AT THE U.S. Army Safety Center are beginning to swell with EIRs, teardown analysis reports, and oil analysis reports relative to both T63 engine failures and incipient engine failures. The alarming element in these reports is that almost all the failures involved excessive engine vibration levels.

Data compiled from a random sampling of these reports reveal that the average failure occurred at approximately 330 hours of operation following overhaul. However, no set pattern could be established as engine failures occurred over a broad spectrum that ranged from a low of 37 hours of operation to a high of 723.

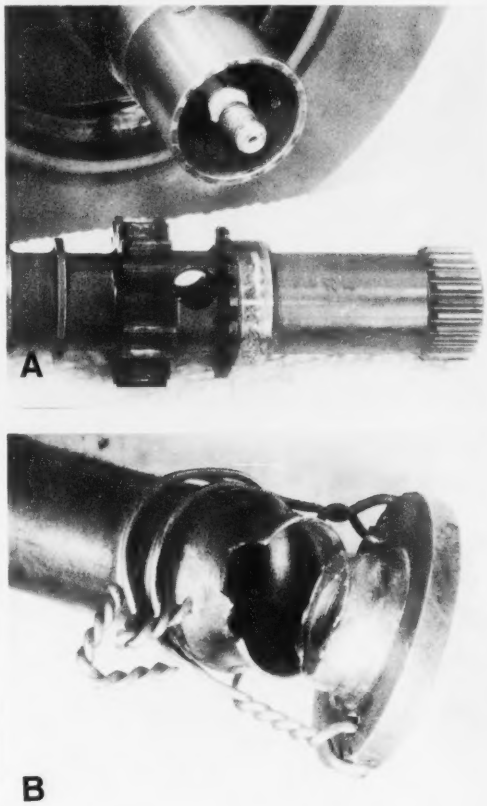
Evidence of vibration was manifested by failed compressor blades, spalled or chipped bearings, and worn splines. Primary part failures included spur gearshafts; spur gear adapters; numbers 2, 4, and 8 main bearings; N1 splined adapters and spacer rings. Other component failures included power turbine shafts, special nuts and washers, compressor rotors and cases, rigid coupling shafts and diffuser vent tubes. Failure of spur gearshafts occurred most frequently—nearly five times as often as any other single primary part failure and appeared in about one-half of all the failures analyzed.



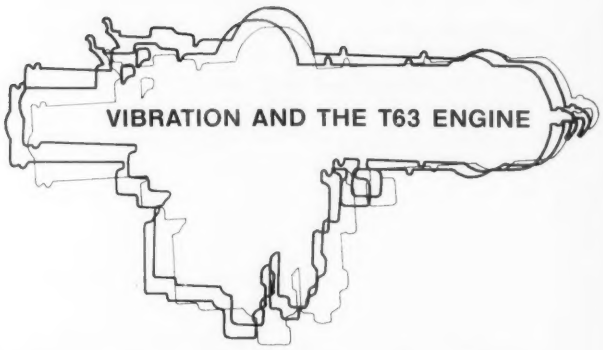
Spalling in outer raceway caused failure of this No. 2 main bearing. In this instance, analysis of special oil sample resulted in early engine removal.

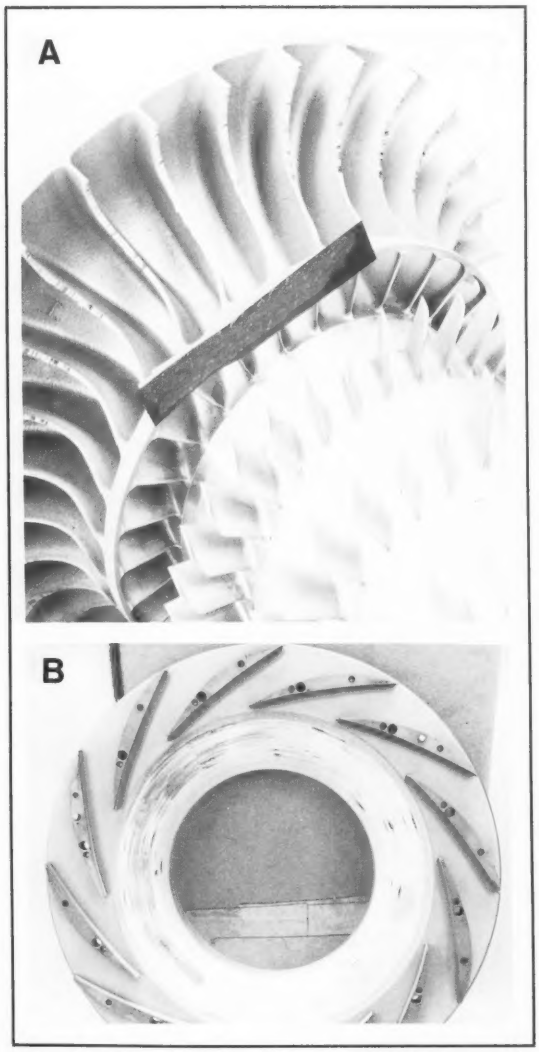


Vibration checks can provide early detection of problems such as those shown by the pictures—before serious damage and inadvertent engine failures can occur.

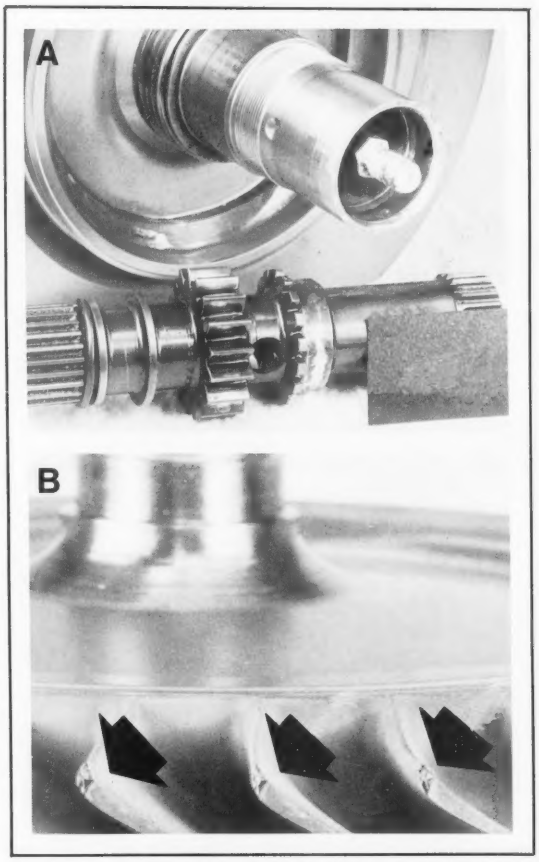


Loose spur gearshaft (photo A) contributed to high frequency vibration that led to fretting of vent and cap (photo B).





Rotation of No. 2 bearing outer race within bore caused wear, allowing impeller (photo A) to contact diffuser assembly (photo B).



Loose spur gearshaft caused fretting of gearshaft and diffuser (photo A); and rotor blade tips rubbing against nozzle resulted in failure of turbine rotor (photo B).

Considering that the time between overhaul (TBO) for the T63 engine (suffix "B" serial numbers only) is 1,000 hours and the average failure is occurring at 330 hours, we are obtaining less than one-third of the service this engine was designed to provide. While these statistics have been computed from a relatively small sampling of randomly selected reports, they do provide a general view of the overall problem. And the impact is extensive.

Incipient as well as inadvertent engine failures produce increased costs for repairs and more frequent engine overhauls, a temporary loss of resources during unscheduled maintenance for engine replacement and what is even more important, they compromise the safety of aircrews and passengers. Although most of the in-flight engine failures resulted in precautionary and forced landings, some produced more serious mishaps. Yet the majority, if not all, of these engine failures could have been prevented by means of a simple engine vibration check.

However, TM 55-2840-231-24 does not require scheduled vibration checks for T63 engines. Yet while no requirement exists for such checks, table 10-1, page 10-5 of this same TM, does list the vibration limits for T63 engines installed aboard aircraft as well as those operated on test stands. Further, paragraph 12-8 (Vibration Inspection), pages 12-3 and 12-4, lists engine inspection requirements when vibrations exceed the limits stipulated in table 10-1. In addition, the Maintenance Allocation Chart authorizes the performance of vibration checks at unit level. What all this means is that you have the authority to perform vibration checks on your T63 engines—even though these checks are not required.

Consequently, you have authorization to obtain the tools and manuals needed to accomplish these checks. And the equipment needed is a vibration monitoring kit (tool No. 171170-0104) and a copy of TM 55-4920-243-15 which provides the necessary instructions for installing and operating the vibration monitor. As previously mentioned, TM 55-2840-231-24 lists the vibration limits for T63 engines as well as engine inspection requirements when these limits are exceeded.

With the necessary equipment and manuals available, one final question remains: Do you have personnel experienced in performing vibration checks? If you do not, contact your nearest direct support unit. A vibration check is *required* on all *T53* powered aircraft after every engine installation and after every hot end replacement. Therefore, these units have experienced personnel who can help you in this area.

Because of the serious consequences inadvertent engine failures can produce, and the rapid increase in the number of vibration-related T63 engine failures, the Army Safety Center strongly recommends a vibration check be accomplished following engine installation, after major engine or drive train maintenance, and any time engine vibration problems are indicated or suspected.

Up to now, the Army Oil Analysis Program (AOAP) has been one of our best means for detecting incipient engine failures. As a matter of fact, if it were not for the current AOAP, the number of T63 failures would have been considerably higher. So don't let up in this vital area. A combination of oil analysis and engine vibration checks will protect equipment and lives.

NOTE: Reference table 3-1, TB 43-0001-2-3, Equipment Improvement Report and Maintenance Digest, dated 1 Oct 78, TM 55-2840-231-24, page 10-1, par. 10-1, tables 10-1 through 10-3 will be revised to include the following note:

Vibration test required after initial installation of engine in aircraft or when excessive vibration is suspected.

For more information on this subject, contact Mr. C. J. Carter, Directorate for Aviation Systems Management, U.S. Army Safety Center, Fort Rucker, AL 36362; telephone AUTOVON 558-4198/3901, commercial (205) 255-4198/3901.

adapted from APPROACH

U.S. ARMY SAFETY CENTER

"The easiest job in the unit"

ONE DAY last week I visited a unit, and in one office, in a far corner, I saw an officer with his feet on his desk, leaning back in his chair reading a copy of FLIGHTFAX. Curious as to who he was, I asked, and was told, "He's the safety officer, and he has the easiest job in the unit. All he does is sit around and wait for something to happen."

That answer was about as far from the truth as the sun is from the earth, but just what is a unit safety officer? And how should he act? The following excerpts from a speech given to a class of graduating safety officers comes close to the answer.

"A safety officer must be mature and forceful, yet tactful; he must be aggressive, yet diplomatic; he must be a combination of aerodynamicist, sociologist, psychologist, metallologist, and militaryologist. He is a salesman, a product demonstrator, a separator of fact and fiction, an advisor, a preacher, and he has to believe in aviation safety. But above all, he must be credible."

The way he conducts his job and, to some extent, the success he has will be based on his own sincere belief that aviation safety enriches mission performance and readiness.

Now, what is expected of a safety officer? First, he must be an officer who sets the example and is a true *professional* in every respect. He should have the reputation of an excellent, aggressive aviator who follows procedures. He should be, or strive to be, the best aviator in the unit. He should show the new guys as well as the oracles that he can get the maximum mission performance out of his aircraft— and get it safely—by knowing and using the system properly and not pushing beyond its limits or his. He should be the complete professional aviator—the paragon of both procedural and instinctive excellence. His flight gear has to be impeccable, his ATM training and dash 10 have to be up to date, and his instrument execution has to be flawless. If he cannot set the complete professional example, there is no way that

he is going to breed a faithful following for his message of safety.

Second, to add to the credibility of his safety program, he should have been there himself. This generally is why safety officers are normally senior. Unless he has had a turn in the weather and lots of night NOE, his credibility will be weak and a lot of his efforts will be in vain. Unless he has empathy with aircrews and mentally shoots that black approach with them, or *feels* with the maintenance man busting himself in subzero weather, torrential rains, or blistering heat to meet the flight schedule, he is not going to understand the safety problem. Having empathy, however, does not mean being soft or overlooking weaknesses or rationalizing departures from proper (safe) procedures. His aviation experience must tell him where to look for symptoms and where and when to act to prevent accidents and near-accidents. That's what safety is all about—preventing rather than reporting or investigating accidents.

Third, he must know his business. He is the command expert in safety. He not only must know the nitty-gritty of everyday Army aviation life, but he is also expected to have an awareness of the multiplicity of factors involving the total safety picture.

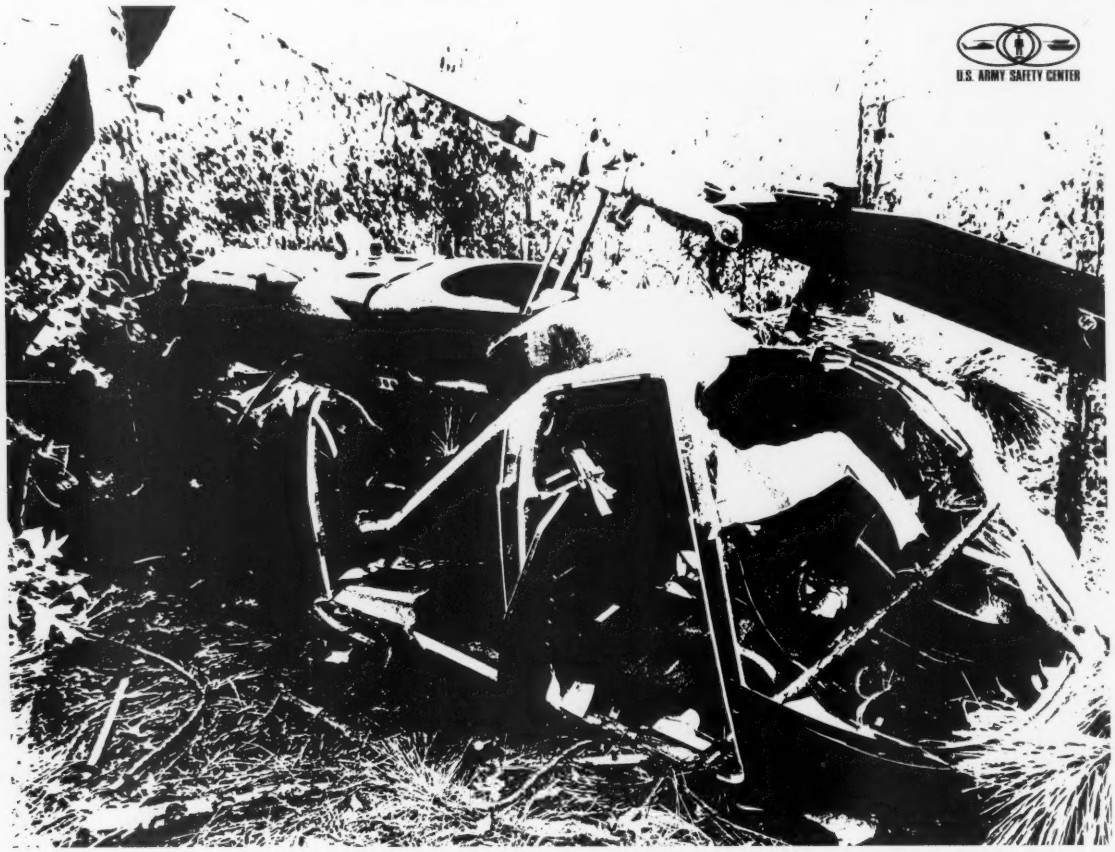
Fourth, he must be aggressive and he must be a self-starter. If he thinks that his job is merely to sit at his desk and process paperwork, he is in for a rude awakening. He must get out of the office and find out what's going on in his command. A specialist can generally handle the paperwork on an after-the-fact basis. His job is to find out where the accident potential exists, and then do something about it. He is not going to be effective if all he does is stare out a window. Aggressiveness is *not* changing the safety poster on the bulletin board once a month; *nor* is it the weekly updating of the command's accident-free-hour bulletin board; *nor* submitting a 50-page accident report. Aggressiveness *is* to anticipate and identify a potential problem, research it thoroughly, and decide on a course of action. Here's where the psychology comes in—and the tact. He may be nicely telling the ops boss that he doesn't agree with him or the maintenance officer that he doesn't know a torque wrench from a spanner. His duty is to give his thoughts and rationale on the subject at hand. It is then the commander's decision as to what to do. But the thoroughness with which a safety officer has researched the problem and possible solutions, and the manner in which he presents his case to the commander or to the interested group in the unit will have a great bearing upon his receptivity. His batting average from the past and his reputation—whether it be as a wolf crier or as a professional expert—will make all the difference in the world. If he has done his homework properly, he won't have any decisions that he can't support.

Next, he should have courage and maturity. He has to be able to socialize with his buddy, and yet, if necessary, blow the whistle on him. He must learn the many graduations available to him between doing nothing and the ultimate, such as recommending a board or a grounding. But he must learn how to be effective, and that will certainly require maturity and may require courage. He must be objective in all his dealings with individuals, whether they be the mech, the mess cook, or the unit hero. No matter how hard they work, how long they work, or how good they have been in the past, if someone has unsafe habits, takes shortcuts, or drives himself beyond his limits, he must be corrected before he is a primary or contributory cause factor of an accident. The accident files are full of the "he was/is my best man" syndrome.

And finally, a safety officer must be seen. He works directly for the commander and is expected to visit him on a regular basis. The commander wants to know what his safety officer is doing with his time.

The safety officer is more than a bookkeeper or a status board writer. He has been exposed to a tremendous amount of material. He has been provided the tools and the techniques to do his job as safety officer. Whether he uses them or not, whether he selects the right one for the right job, and whether or not he meets the requirements for this unforgiving environment depends upon the time and attention that he, as the architect and builder, gives to his final program of readiness through safety. He must become a master craftsman with true dedication to his art. He has a lot of responsibility and not, by any measure, "the easiest job in the unit."

SUMMER BREEZES



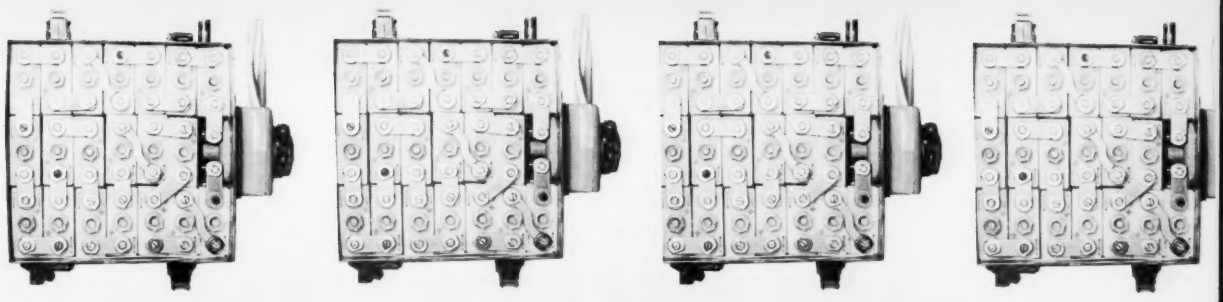
MAY SIGNALS the beginning of hot weather operations when helicopters will be flying with doors open or removed so that everyone can enjoy the cooling breezes. Unfortunately, the breezes frequently clean out the cabin of everything that isn't firmly secured or removed . . . seat cushions, helmet bags, and equipment.

A case in point involved an OH-58 pilot who was going to fly his aircraft with the doors removed. The pilot, along with his crew chief, inspected the aircraft and either secured or removed all loose items . . . all except one, the rear passenger seat backrest cushion. The cushion blew out of the aircraft during flight and struck the tail rotor, severing the tail rotor blades. Antitorque control was lost and the aircraft crashed, killing the pilot.

In another case, a UH-1 pilot began a descending turn after dropping six parachutists. While the jumpmaster and crew chief were unhooking the parachute deployment bags from the anchor cable, a gust of wind pulled one of the bags out of the open doors. The bag hit the leading edge of the tail rotor blade, and the tail rotor section disintegrated. The aircraft was landed in a motor pool area, the main rotor blades hit a wrecker, and the aircraft was destroyed.

With the peak summer flying period just ahead, we can expect similar accidents unless every pilot takes the time—and the extra caution—to ensure that *all* loose items are secured or removed before flight commences with the doors open or removed. This is an absolute necessity.

In parachute operations, pilots must brief jumpmasters not to unhook the deployment bags until the mission is completed and the aircraft on the ground.



NICAD BATTERIES

A hot summer item

High temperatures, plugged filler cap vents and failure to service and maintain the battery as specified in the technical manuals have contributed to the present nickel-cadmium battery problems

DURING THE PAST 3 years, Army pilots have been involved in more than 350 mishaps caused by nicad battery problems, principally overheating. Overheating can cause a thermal runaway condition and even explosion.

The first step toward preventing thermal runaway lies in the care and maintenance of both the aircraft's electrical system and the battery.

- The voltage regulator must be precisely adjusted by the book and functioning properly.
- The battery must be correctly maintained, kept clean, and properly installed, with the vents clear.
- All battery servicing and charging should be accomplished in an approved battery shop.
- External power sources should be used when making prolonged ground operational checks of aircraft systems, during troubleshooting procedures and, when possible, for engine starts, especially if a series of flights of short duration are scheduled.
- During battery starts, procedures and limitations listed in the appropriate operators manual (—10) should be closely followed.

In addition to these preventive measures, the pilot can use certain indicators to warn him of impending battery problems, including thermal runaway. For example, during a battery start, a healthy battery should readily accelerate a gas turbine engine above 15-20 percent rpm. If it can't, have it checked. During flight, the pilot can use the loadmeter to periodically monitor the battery. Should the loadmeter indicate an increase of approximately 10 to 20 percent above the normal stabilized indication, the pilot can suspect a battery problem. To verify it, he can then turn off the battery switch. If the loadmeter shows a sharp decrease in load, he should leave the battery switch off, land at the nearest airfield and have qualified maintenance personnel check the battery.

Also, if electrolyte spewing is noted or battery fumes detected in the cockpit during flight, the battery switch should be turned off immediately, a precautionary landing made, and the battery checked.

One final bit of information

TM 55-1520-210-10 carries the following warning: "Do not open battery compartment and attempt to disconnect or remove overheated battery. Battery fluid will cause burns and overheated battery will cause thermal burns and may explode."

In short, leave an overheated battery alone *when no fire is present.* Along with this warning comes another borrowed from a sister service. While this pertains primarily to firefighting and rescue crews, we should all be aware of it. It reads as follows: While CO_2 is an acceptable fire extinguishing agent once a fire has developed, in no case should CO_2 be directed into a battery compartment to effect cooling or to displace explosive gases when there is no fire. The static electricity generated by the discharge of the extinguisher(s) could explode hydrogen/oxygen gases trapped in the battery compartment.

Nicad battery inspection checklist

The eighth edition of the "Guide to Aviation Resources Management for Aircraft Mishap Prevention" contains a nicad battery maintenance inspection checklist. If you need a copy of the Guide, write Commander, U.S. Army Safety Center, ATTN: PESC-CA, Fort Rucker, AL 36362, or call AUTOVON 558-4479, commercial (205) 255-4479.

PEARL'S

Personal Equipment & Rescue/Survival Lowdown

If you have a question about personal equipment or rescue/survival gear, write Pearl, DARCOM, ATTN: DRCPO-ALSE, POB 209, St. Louis, MO 63166

Hatchets

We have all heard of the "hatchet man," but you could become one also, in the event of an aircraft accident. Some feel that a hatchet or emergency escape axe should be installed in each aircraft to assist in emergency egress of a crashed aircraft. Most of us have forgotten but MWO 55-1520-202-34/34 (15 June 1965), Emergency Escape Axe Installation Kit, was an approved modification for the CH-34 aircraft.

The modification work order also advises that remaining Department of the Army aircraft are not restricted from installing the axe if desired, at the discretion of field commanders. The Modification Kit Emergency, NSN 1680-00-906-3918, is still available from B17 and the cost is $29.00.

Break Light

This is not the typical "brake light." With this item you only get light if you break it to mix the chemical solution together, which gives an amazing amount of glowing light. I hear that many aircrewmembers are including this light as part of their survival package. The item is available from S9G, light wand chemical, NSN 6260-00-106-7478.

Masked Aviators

If you are flying at altitudes that require oxygen, and you don your A-13A oxygen mask, you may find that the breathing apparatus does not perform as designed due to icing. One of the reasons that icing occurs is that some aircrewmembers are using medical oxygen, rather than aviation oxygen. Medical oxygen has a higher moisture content and may cause the breather valve of your oxygen mask to freeze up. Another reason for mask icing is that the mask is not cleaned properly and dried from your last flight. The MBU-5/P oxygen mask that some aircrewmembers are using also will freeze up or suffer icing problems if it is not cleaned properly and dried. Air Force TO 15X5-4-4-12 will assist you in maintenance procedures and inspection of your mask.

ELT Lithium Battery

The Federal Aviation Administration (FAA) has advised that emergency locator transmitters (ELTs) with lithium batteries should be removed from all aircraft in which they may be installed.

Lithium batteries could explode violently causing danger to the aircraft or its occupants. Lithium batteries which may be installed in ELTs, or others which may be in storage, should be turned in to the property disposal officer for proper disposal.

FAA has advised me that lithium batteries are extremely difficult to identify, unless the instruction manual for the ELT identifies the battery as such. One clue to identifying lithium batteries is the shelf life date. Originally lithium batteries were advertised to have a shelf life of 10 years. So we can only assume that if you have an ELT battery that indicates a shelf life of more than 3 years, that it is a lithium battery.

The FAA advisory list the following ELTs that are known to have lithium batteries; however, this list is not considered to be inclusive:

- Communications Components Corporation
  Model CIR 10 All Serial Numbers
  Battery Pack BP-60, BP-60A and BP-60B
  Model CIR 11-2 All Serial Numbers
  Battery Pack BP-60-11, BP-60-11A and BP-60-11B
- Cessna Aircraft Company
  Part Number C-585511-0103
  Part Number C-559510-0202

Part Number C-559510-0209
- Dorne And Margolin
  Model DMELT 6 Serial Number 1 And Subsequent
- Garrett Manufacturing Limited
  Part Number 627810-1 Serial Number 108 Through 24-94
  Part Number 627810 Serial Number 101 Through 113
  Part Number 627810-3 Serial Number 101 Through 255
- Leigh Systems
  Model SHARC 7
- Pointer Incorporated
  Model 2000
  Model 2000 Series Mod A
  Model 3000
  Model 3000 Series Mod A
  Model 3000-2
  Lithium Battery Pack — P/N P2018, P2018 HSP, P2018 HSM, M2018, M2018 HSP and M2018 HSM.

Bennie Duhaime Photo by Tom Greene

U.S. ARMY

AVIATION STANDARDIZATION

Directorate of Evaluation/Standardization

REPORT TO THE FIELD

DES welcomes your inquiries and requests to focus attention on an area of major importance. Write to us at: Commander, U.S. Army Aviation Center, ATTN: ATZQ-ES, Ft. Rucker, AL 36362; or call us at AUTOVON 558-3617 or commercial 205—255-3617. After duty hours call AUTOVON 558-6487 or commercial 205—255-6487 and leave a message

THE CH-47 AVIATOR

SINCE THE INCEPTION of the Aircrew Training Manual as the primary standardization document, the Directorate of Evaluation and Standardization (DES), United States Army Aviation Center (USAAVNC), Ft. Rucker, AL has observed virtually every aviation unit that operates the CH-47 Chinook cargo helicopter during the conduct of Aviation Standardization Evaluation/Assistance Visits. From these visits, DES has identified several significant training limitations in aviator proficiency that generally are found throughout the CH-47 Chinook community.

Of particular importance are the recurrent deficiencies that surface during our annual visits. Repetitive findings/observations have been noticed in weight and balance computations, performance chart utilization and instrument flight planning proficiency. Also, additional repetitive discrepancies have been noted in emergency procedure training and knowledge of aircraft operating limitations.

For the most part, the problems with weight and balance computations seem to be, first, a lack of understanding of the required forms and records that constitute the weight and balance file and the information contained therein. Second, many aviators, although aware of the inherent responsibilities as outlined in AR 95-16 and DOD FLIP, have a difficult time computing the clearance forms, DD Form 365F.

Directly related to the weight and balance finding is the sporadic use of performance planning charts. While some units have developed positive programs that incorporate *daily* use of the aircraft operator's manual, others have all but left it up to the discretion of the individual aviator. Knowledge of the aircraft's performance margin cannot be overemphasized. Regular use of the available charts will allow aircraft performance to be computed more easily and quickly. Although maximum performance is not always required, familiarity with the charts will assist in the decisionmaking process when unexpected situations are encountered.

Notwithstanding the recent changes to AR 95-1, aviators continue to have some difficulty with instrument flight planning procedures, to include tactical instruments. Some of the repetitive difficulties are: When and how to enter an en route delay explanation, the estimated time on route for en route delays and the stopover format. Tactical instrument flight planning is being practiced to varying degrees of intensity. Those units that do tactical instrument planning have no problems. For those units that have difficulty in tactical instrument flight planning, continuation training scenarios should incorporate realistic combat situations requiring the use of tactical instrument procedures.

The recent publication of the new CH-47 Operator's Manual and associated checklist has created a need for an affirmative reeducation process. Along with a revised format comes a totally new philosophy to emergency procedures. The brief discussion that introduces each procedure is designed to provide an understanding of the general indications of the malfunction and a preferred course of corrective action. The intention of this design is to reduce the number of steps in each procedure so as to enhance memorization. In order to reduce deficiencies in emergency procedures, all training should incorporate categorical use of the Operator's Manual and Checklist—promote recall by association!

Overall, the Chinook community enjoys a relatively high degree of hands-on proficiency. Reestablishment of a minimum flying hour requirement and an associated maneuver table should help preserve individual aviator proficiency.

The above comments should not be taken as an indication that CH-47 pilots are not up to speed. On the contrary, generally, the CH-47 pilot's performance is very high. So, keep up the good work!

Four TOW Cobra helicopters from 503d Avn Bn fly high over the 600-year-old Salisbury Cathedral on the Salisbury Plains, England.

Photo courtesy of British Army

Charlie Company Goes To England

VISIBILITY WAS GOOD as the flight of seven AH-1 attack Cobra TOW helicopters flew over the German and then Belgium countryside. CW3 Danny Stepp was the flight leader.

About 7 hours into the flight, which included two fuel stops, CW3 Stepp contacted the radar service that handles flights over the English Channel. "Kent Radar, this is U.S. Army copter two-triple zero-seven; I have a flight of seven Cobras for crossing. Over."

A controller who sounded very English came back with, "Good afternoon two-triple zero-seven, I have you on radar; proceed on heading two-eight-three and report the coast in sight. The winds are light from the east, barometric pressure is 1016."

CW3 Stepp squeezed his mike switch, "Roger, Kent Radar." He then turned his radio selector switch to #1 to talk to his flight. "Okay, Sabre flight, it's time to cross the pond. Keep the formation tight and let's show the British how U.S. Army helicopter pilots do it. England, ready or not, here we come."

The ships and small boats in the channel were treated to a beautiful sight as the seven attack helicopters from the 3rd Armored Division's C Company, 503d Aviation Battalion flew a perfect formation. Cruising at 120 knots, they made the crossing in less than 15 minutes. The flight leader reported sighting the White Cliffs of Dover and radar control cleared the flight to fly the VIP route over the Thames River through the city of London.

Captain Tony Geishauser
Public Information Officer
Headquarters, 3d Armored Division
APO New York 09039

ABOVE: The Cobra in the background fires TOW downrange as Cobra in the foreground uses suppressive minigun fire. LEFT INSET: Armament specialists ready the Cobra for day's aerial gunnery. RIGHT INSET: SFC Don Worton (left), C/503d aircraft armament supervisor, shows how Cobra's minigun should be fed belt ammunition.

The pilots banked their aircraft with each turn of the Thames as they took in the sights of Old London Town. The massive city sprawled beautifully below with double decker buses driving on the "wrong" sides of the streets, Tower Bridge stood in all its majesty and dozens of soccer and rugby fields were in use on the outskirts of the city.

The British controller handed the flight leader off to another controller for the continuation of the flight after the VIP leg was complete. He ended his routine transmission with, "welcome to England."

These Soldiers of Charlie Company had arrived in England to qualify in aerial gunnery on the Larkhill range complex on the Salisbury Plains. Their trip to England was part of a test program by U.S. Army, Europe (USAREUR) aviation to see if it was feasible to train USAREUR-based attack helicopters in England. It is generally felt that the ranges in Germany aren't large enough to get the most benefit out of training with the Cobra. Also, Cobra units have to compete for the ranges in Germany with the Artillery and Armor units.

A platoon of comptrollers and other data analysts will determine if the trip was feasible or not, but the pilots of Charlie Company have already formed their opinions.

"From our point of view," said the unit's operation officer, Captain Paul Mann, "it was a great success. We proved it was feasible to fly there and back without a hitch. We did it and we did it in the wintertime.

"What we were able to do in England was a quantum jump over any type of Cobra training I have seen done anywhere before," CPT Mann added.

Third Platoon Leader, CPT Wayne Killian agrees. Most of the seven Cobras that went to England were from his platoon.

Captains Mann and Killian outline below some of the innovative training they were able to conduct in England.

Lack of Normal Range Restrictions. *CPT Killian:* "About 90 percent of the Cobra pilots hear the following scenario when they are about to fire on a regular range: 'Start here, fire when I say fire, cease fire when I say cease fire, turn off here, come around and cross the line again. I will tell you when to fire and what weapons to fire.' On top of this," CPT Killian adds, "you usually can only fire one aircraft at a time.

"In England it was a lot different. We were able to *fire* and *maneuver* in sections and as a platoon. At times we had five Cobras firing at the same time with suppressive fire and TOW fire. Additionally, the scout aircraft were there to acquire the targets for us like they are supposed to. It was great; we trained to do just what we would do in combat."

SGT Stephen Nelson places a 2.75 rocket into the Cobra's rocket pods. Charlie Company fired 1,500 rockets during a week's training in England

A Charlie Company Cobra fires 2.75 rockets on targets at the Larkhill Range Complex on the Salisbury Plains of England

Photographs by SP4 Keith Dixon

Armament specialists ready a TOW Cobra with belt ammunition for the day's aerial gunnery training

One of the few restrictions CPT Killian put on the pilots was to tell them, as the platoon leader, which weapon systems they would be firing.

Indirect Firing of Rockets. On the huge ranges in England, Charlie Company pilots were able to do something they had only talked and read about in their flight manuals. *CPT Mann* stated, "We actually had a chance to practice indirect fire with the rockets, disregarding our M73 sights and only using our heading and attitude indicators."

What were the results? CPT Mann adds, "The results were terrific. The manuals are right. We hit the targets by doing it that way, but the point is that we finally had a chance to do the actual training. We don't have to talk about it or wonder about it any more. We know it works because we were finally able to do it."

Flying Loaded. *CPT Mann:* "In Germany, you can't load up with

ammo at your base and fly to the ranges. In England we were able to do just that. We loaded ammo onto the birds, flew off the military reservation, and flew cross-country to the ranges where we fired our munitions. This is unheard of in Germany."

CPT Killian: "There was a great side benefit to this particular aspect of our training. As all pilots know, there is a lot of difference in flying a fully loaded aircraft and an empty one. When we are on the ranges in Germany we might get the feel of a fully loaded Cobra for all of 5 minutes and perhaps fly it one kilometer to the firing line. In England the pilots were able to fly the fully loaded aircraft 10 plus miles to the ranges. It was good training—training that we needed."

Firing the Minigun. *CPT Killian:* "In England we were often the sole users of the range. During some of those periods we were able to get into the impact area and utilize the flex capability of the minigun. This is still another training aspect we have been unable to do in Germany."

International Navigation. *CPT Mann:* "One of the most interesting side benefits of the trip was the international navigation aspects of the flight. Once again, talking about doing it and actually planning for and doing it are two very different things. We had classes on exactly how we were going to do it. Flying in Europe is a lot different than flying anywhere else in the world."

There were many other benefits derived from this trip such as the interoperability training with the British.

One of the highlights of the entire trip was a firepower display put on for the British military and the local press. The scout aircraft arrived first, acquired the targets, then the Cobras arrived onstation to suppress and fire TOWs at the targets.

Those in the audience were duly impressed as all five TOWs with inert warheads hit their targets. The 2.75 rockets also were on target as was the impressive minigun fire. "They don't miss!" one English tank commander was overheard to say.

But they did miss—once. Near the end of the training, a pilot missed a minigas can placed on the back of a tank at 3,500 meters. A camera with a super telephoto lens revealed that the TOW missed by about 8 inches. CPT Mann said, "It shows the confidence we have in the system to haul off at 2 miles to punch a minibox can."

OPPOSITE PAGE: A Cobra crew checks out the Larkhill range complex for targets. The Cobra in the background is taking a target under fire

RIGHT: A C/503d Cobra takes off from the 7th Regiment's Airfield Camp at Neatheravon to the Larkhill range

Beans and Bullets Aspects of the Trip. Charlie Company executive officer, CPT Dennis Clausen had the responsibility of coordinating with the British for all their support. His liaison officer was CPT Doug Drennen of the 658th Squadron, British Army Air Corps. CPT Clausen couldn't get over how "can do" the British were. "We were getting here just what we would be getting back home in the way of support, plus a touch of class," he said.

There was one major problem with fuel that had to be overcome. Most aviation units using jet fuel in England now are using JP-8 rather than JP-4. Even though the manuals list Jet AI+ Fuel (which is roughly JP-8) as an alternate fuel for JP-4, U.S. authorities felt there was a risk factor in using the hotter burning JP-8 as a primary fuel. As a consequence, JP-4 had to be borrowed from a U.S. Air Force base in England. Within months, however, all units based in England will convert to the new fuel.

In order for the Cobras to use the JP-8, modifications probably will have to be made to the fuel controls. This will be key to further training flights to England.

Charlie Company commander Major Gary Ellis was proud of his unit's effort in England. All 18 pilots that went on the trip qualified on all of the gunnery tables. "The 72 enlisted personnel that supported the pilots were key to the overall success we enjoyed," said CPT Ellis. "Without our people's teamwork, we wouldn't have been able to hit very many targets," he added.

Before Charlie Company left the famous Salisbury Plains, they had riddled it with many new holes. They fired 12 TOWs, 1,500 2.75 rockets, and 90,000 7.62 rounds of minigun ammunition.

There also was a historical footnote to the trip to England. The 3rd Armored Division aviators trained at the British Army's 7th Regiment at Neatheravon Airfield Camp on the Salisbury Plains, about 80 miles southwest of London. This was the same area where the 3rd Armored Division trained some 35 years earlier prior to the World War II D-Day invasion of Europe. From September 1943 to June 1944, Spearhead Soldiers conducted extensive combat training all around the Plains. The division headquarters was located in Warminster, 30 miles from where the modern day Spearheaders were training.

One thing is the same now as it was then, good British hospitality. Each member of the company had a chance to test the outstanding hospitality of their host nation by visiting the local communities before they left. Some even had a chance to take the train into London. There was one universal complaint heard after it was all over, over there—"We didn't stay long enough."

ATC ACTION LINE

UNITED STATES ARMY COMMUNICATIONS COMMAND

As a frequent medevac pilot, I have been given priority over other air traffic even after the evac is completed and I'm on the way back to the barn. How come?

In a recent proposal to the Federal Aviation Administration, military air evac operators advised that they did not want priority in air traffic sequencing unless specifically requested, due to the potential disruption of high density traffic flow at certain terminals. Consequently, the FAA changed the controller's manual (7110.65A, Change 5, effective 1 Apr 1979) to require priority handling of military flights using AIR EVAC-MED EVAC-LIFEGUARD call signs *only when requested by the pilots.*

What's happening with the microwave landing system?

Well, the *good* news is that the U.S. time reference scanning beam MLS has been adopted by the International Civil Aviation Organization as the international replacement for the instrument landing system.

So what's the *bad* news?

The original plan was to commission the first MLS in 1977—well, that date has slipped. However, FAA is initiating a Service Test and Evaluation Program in which they are transitioning from the research and development phase into the implementation phase. FAA is installing an MLS at Washington National Airport as a part of the STEP. They will install MLS at other locations as a part of this program over the next few years.

Hold it, what does that mean to us Army aviators?

It means that you won't be seeing the MLS in Army aircraft until after 1985. This means we'll have to keep on using our ILSs and ground controlled approach radars for a few more years.

OK is not OK! Why not?

Suppose we have an aircraft taxiing out to the active runway, and the pilot requests a change to another runway. Further, suppose the ground controller's reply is "OK," standby. (Coordination with local controller is required.) The pilot only hears the "OK" and proceeds to the requested runway and en route crosses the original active runway. Things are not-so-OK now, especially if an aircraft is landing on the runway the pilot is crossing. You say it can't happen—it can, but it shouldn't.

Okay, to add to the problem, the controller in this theoretical incident misused OK to acknowledge receipt of the pilot's request, not to approve it. But how is the pilot to know that? A sharp pilot will request confirmation or otherwise realize that specific clearance to the requested runway was not received. But the pilot may not request confirmation, especially if accustomed to using or receiving sloppy phraseology. Similarly, when aircrews acknowledge with "OK" it's difficult to know whether they mean *"roger," "affirmative," "will comply," "that's correct," or something else.*

According to most dictionaries OK and Okay are used primarily to express agreement or approval. OK means "approved" not "stand by" and not "Message received, reply follows." But in air traffic control, OK is not approved phraseology, and it's not "Professional"—OK is not OK in ATC!

Okay now, this blurb on OK should be enough of a reminder to KO OK in ATC. Okay?

Readers are encouraged to send questions to:

Director
USAATCA Aeronautical Services Office
Cameron Station, Alexandria, VA 22314

U.S. GOVERNMENT PRINTING OFFICE: 1979—640-046/2

CONTROLLERS

Jan Welch
Aviation/Operations Office
U.S. Army Communications Command
Fort Huachuca, AZ

EXACTLY WHAT and who is this Army air traffic control person? Ask a dozen people and you will probably get that many answers—similar perhaps—but different. To the civil aviator flying visual flight rules, stuck on top of the clouds or lugging around in marginal VFR conditions somewhere in east Texas, that calm voice on the radio saying "two-one whiskey, radar contact one six miles southeast of airport, turn right heading 350," rates somewhere between mother and God.

On the other hand, to the impatient pilot thinking of the miles to go before dark, that same voice saying, "Army 1234 hold present position," is nothing but a dictator.

An objective look at the Army air traffic controller reveals a highly trained professional, whose job routinely requires instant decisions.

Lives and property depend on each decision being correct the first time. There are few second-thought options in the real ATC world.

Exactly how is an Army air traffic controller created?

The first requirement is a high (105 or better) mental aptitude score. The second is the ability to meet the stringent requirements of a Class II flight physical.

When these two crucial checkpoints are passed, the third step is an intensive 16-week radar and 13-week tower training course at the U.S. Army ATC School, Ft. Rucker, AL.

The course of training at the school is a total immersion package designed to teach everything from how to do it, to how to say it. The common subjects portion of the instruction covers the whole air traffic control spectrum from the viewpoint of both controller and pilot. Some of the more significant areas covered include ATC procedures, FAA rules and regulations, airspace, aviation weather, phraseology and NAVAIDS operation.

The academic instruction is largely self-paced with sound and slide programed text. The usual ratio is 1 instructor for 10 academic students and 1 instructor for 2 practical application students.

Classroom instruction is reinforced with laboratory exercises designed to create a realistic environment for the student. The laboratory equipment looks just like that in general use in Army ATC facilities. Computer-generated problems are solved by the students.

Academic and laboratory standards are very high. An overall score of 90 percent is the most common standard applied on the pretest for any block of instruction. Under normal conditions only one phase back for any block of instruction is permitted. Only after these standards are met is the student tested and moved on to the next phase of training. Even after graduation from ATC school, the controller still is not ready to tell aviators what to do.

The new graduate only has a license to continue learning and the chance to complete the fourth and final step to become an air traffic controller.

On assignment to the first facility after graduation, the potential controller finds a real world training situation with even more exacting standards.

Controllers assigned to a tower must complete a minimum of 6 months in training. Then they may be eligible for a facility rating test and the issuance of that all-important control tower operator certificate that allows them to control traffic without supervision.

Controllers assigned to the radar environment find themselves with equally stringent training requirements but slightly different time limits.

The Army radar approach controller is allowed 1 year of training time because of the difficulty of the operation. Assignment to a ground controlled approach function allows for a 3-month training period.

The reasons for these exacting standards for Army air traffic controllers are simple. Safety of flight is the paramount one. Army air traffic control operates largely within the National Airspace System, subject to Federal Aviation Administration standards.

However, under tactical deployment conditions some of the time requirements may be modified to meet operational needs.

If it sounds as though becoming an Army air traffic controller is difficult, it is. It is a challenging, demanding profession in which only the best and most highly motivated Soldiers can endure.

So the next time one of you Army aviators communicates with an Army air traffic controller, rest assured that you are talking to another professional.

Acronym Key
Page 9

Readers Help Build An ASH

story and results on page 24